

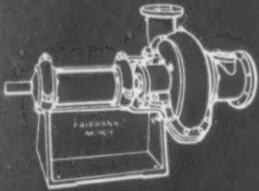
IRON AGE

THE NATIONAL METALWORKING WEEKLY

March 9, 1950

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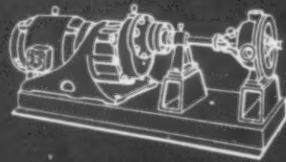
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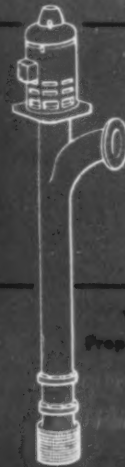
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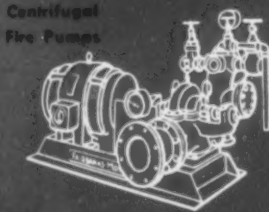
Frame Constructed Rotary Pumps



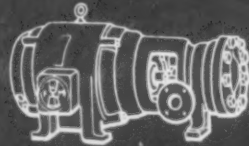
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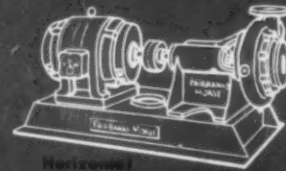
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Propeller Pumps



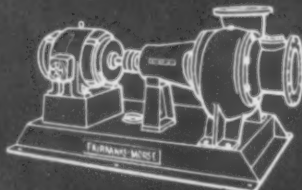
Centrifugal
Fire Pumps



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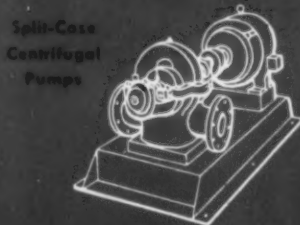
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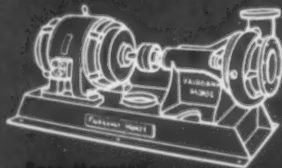
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A name worth remembering

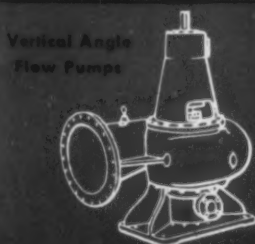
DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
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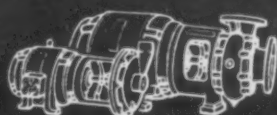
Split-Case
Centrifugal
Pumps



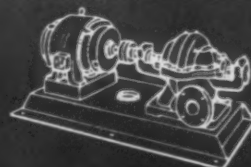
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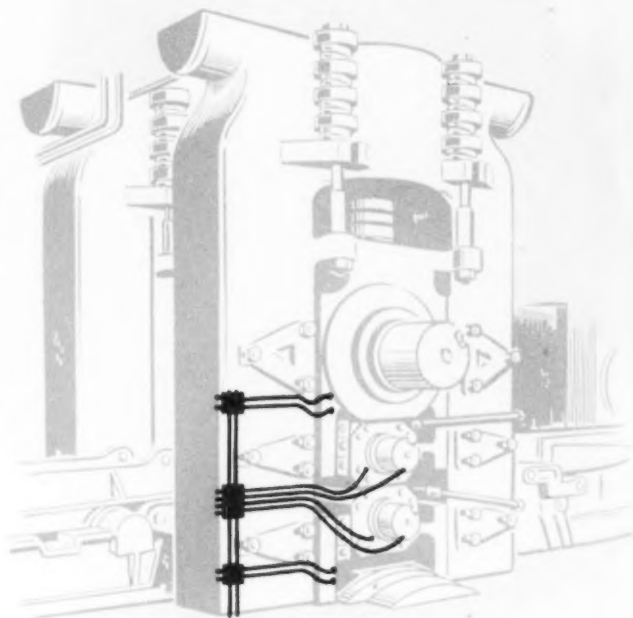
This Farval installation serves more than 6,000 points on work roll bearings, screwdowns, chutes and loopers, cooling beds, tables, coilers, flying shears, levellers and miscellaneous processing lines. Each time the mill was expanded, further Farval protection was provided.

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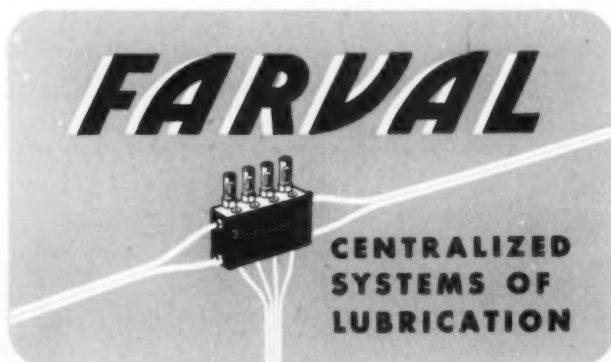
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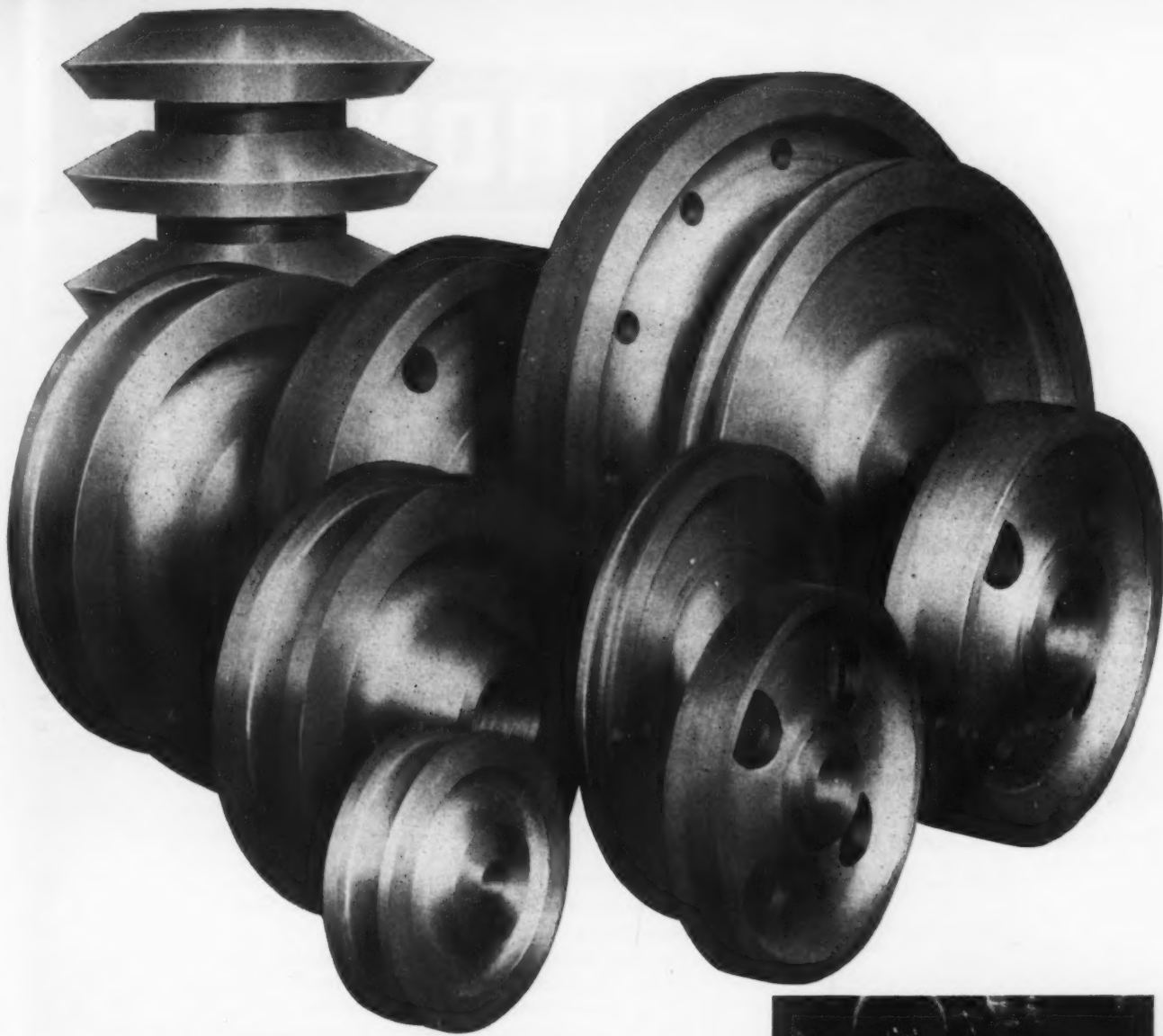
For a full description, write for Bulletin No. 25. The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Co., Industrial Worm Gearing. In Canada: Peacock Brothers, Ltd.



← **FARVAL—Studies in
Centralized Lubrication
No. 113**





As good as they look

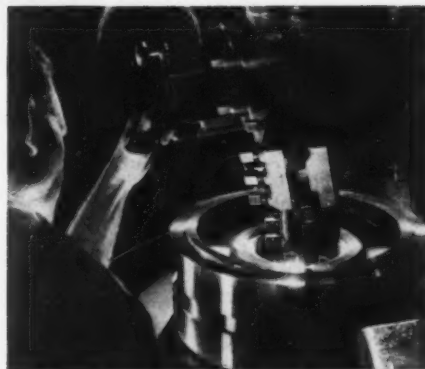
Here's a handsome family picture—a group of Bethlehem's circular steel blanks all rough-machined and cleaned up prior to shipping. They look good and they *are* good—all the way through.

Bethlehem has its own unique method of making circular blanks like these—a three-way upsetting, forging, and rolling operation that imparts unusual strength and toughness. It also makes for good grain structure and uniform density. These qualities are particularly valuable in gears, crane wheels, turbine rotors, brake wheels, and similar round pieces.

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March 9, 1950

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IRON AGE

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Special Article



Lubricants play a vital part in wire drawing. Wire types and sizes, methods of operation, speed of draw, drafting practice, and die design govern lubricant selection. Lubricant recommendations for rod, intermediate wire and fine wire drawing in wet and dry systems show vast variety of materials used and where they are applied.—p. 65.

Issue Highlights



New repair technique for steel forgings allows savings in time, material and equipment. Broken mill spindle is repaired at Kaiser Steel Fontana plant by burning off the fractured end, machining the part to fit a new jaw, and then shrinking new cast steel jaw onto the original forging.—p. 70.



Since finishing practices for stainless steel have many variables, precautionary measures must be taken. Major considerations and recommendations of equipment and methods as related to physical properties of these steels are presented. Grinding operations are covered in the first part of a two-part article. Polishing and buffing will appear later.—p. 73.



While steelmakers anxiously await shipments of coal this week, steel consumers are pressing harder for delivery. Although most have enough steel on hand for current operations, few have satisfactory inventories. It will take a few weeks to sort the chaff from the good orders.—p. 93.



The new proposal for lower rail rates would help offset the disadvantage of Pittsburgh steel producers shipping into Detroit and New England. This is the first time since 1917 that Pittsburgh mills haven't found themselves on the short end of a freight rate change.—p. 99.



The aluminum tubing market has gained a tremendous new potential due to the development of new types of aluminum and new techniques of fabrication. Among advantages cited for aluminum in the heat exchanger field are low cost, good heat transfer and resistance to corrosion.—p. 103.

Coming Next Week



Chevrolet automatic transmission incorporates a new principle in converter design. Precision stamped and brazed elements are fabricated from sheet steel rolled to special thickness tolerances. The method opens up a new field in design of transmission converters and points the way to more extensive use of parts drawn or stamped to precise shapes and dimensions.

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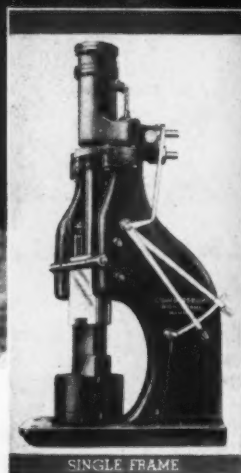
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Editorial

INDUSTRY VIEWPOINTS

Is It Any Wonder?

PEOPLE who toss bricks at businessmen these days ought to look around. We are breeding a new generation that may or may not be the answer to the riddle. That generation may have to pick up the pieces flying around these days. Pieces of old fashioned but proven ideas that have been knocked to smithereens by "security" minded people, palpitating politicians and would-be Messiahs.

The farmer gets paid not to grow things. When he does grow something he gets paid for what he doesn't get for his products. When workers get the sniffles they stay home and rest. When they get older they retire. When things don't suit them they slow down.

When the unions think they are not getting a big enough bite of the total take they call a strike and our government helps them. The boss no longer has much to say about running his business.

John L. Lewis takes out on the coal operators, industry and the public his private phobias. While he thinks up new and fancy ways to try to get what he thinks he ought to have the nation suffers, the President takes his time and the Taft-Hartley Act becomes meaningless.

If that isn't enough the children won't eat their dinner because they have to look at television. Papas no longer have anything to say at home either—even though they had little to say at the office. So they get frustrated.

Then we have scientists telling a vast audience that it won't take but minutes to blot out the universe. They deal in vivid word pictures of what can happen, how many will be killed and why.

All this time the businessman is trying to run his business. Yet people seem to be getting into a neurotic state that is just ripe for a promise of two cars in each garage, two chickens in every pot and a television set in every room.

Mr. Truman has it all down pat. We are going to have the good life. We are going to abolish poverty. Everyone is going to make 12 grand a year. All we have to do is spend our way to it. What matters if we don't have the cash now? We can get it later—much later.

Government workers who deal in millions, billions—and soon trillions—have no conception of how hard it used to be to make a few bucks. Nor do they give a hoot. They have to keep their jobs. The department head in government has to keep his job and the politician has to keep his voters.

Business indexes go up and up. Everything is free. Everyone has do-re-mi. Today we live. Tomorrow we may be part of the bomb that blows us wide open.

Is it any wonder that business has a hard time answering its critics in this din? Is it any wonder that a lot of people in business wonder how in the world they got there? And is it any wonder that shows like South Pacific—with its never-never-land of sunshine and glee—are packed and no seats are available till next autumn? Is it any wonder?

Tom C. Campbell

Editor



NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► One reason for the Atomic Energy Commission's intense interest in new metals is the way existing materials are effected by radiation. While ordinary equipment must be protected from the effects of moisture, heat and corrosion, a GE scientist points out that the job of protecting structural materials that might be used in atomic power plants raises a whole new array of procurement problems.

► Despite the talk about inefficiency of torque converter transmissions, the fact is there is a great deal more variation between car drivers than there is between types of transmissions.

► Suggestion plans continue to be a powerful management tool. Between August 1947 and January 1950 Ford Motor Co. received 32,815 acceptable employee suggestions. Nearly 30 pct of these have been authorized for trial. Total payments for these ideas were \$326,000, of which 22 were for \$1500.

► The sheared edge extra charge on steel sheets has reversed the mill edge-sheared edge pattern in carbon steel sheets. The ratio is now 85 to 15 in favor of mill edge on the books of one large steel company. A partial swing back to sheared edges is expected, however, because some buyers are going to find their sheets short on width after trimming.

► Powder metallurgy may soon make a bigger dent in the stainless steel field. A new stainless powder said to have considerably improved moldability has just been developed. It is reported to form almost as well as common iron powder.

► Look for a sharp pickup in ductile cast iron applications soon. Within a month or so it is likely that it will be possible to guarantee the mechanical properties of at least four standard grades. This is what many design and production engineers have been waiting for.

► Experimental V-6 engines are now being built but they are not likely to be introduced soon. There are two reasons: (1) Rigidity, the outstanding advantage of the V-engine, will not really be needed until compression ratios rise to 10 to 1 or higher; and (2) ample rigidity can now be obtained in an in-line "6" by other means and at lower cost. There might also be some expensive body design changes required.

► There is a good possibility that the government-owned brass mill in Chicago, operated during the war as the Revere-Ordnance plant, may soon be converted for cold-rolled steel strip production if present plans materialize. (This does not affect Revere's own commercial plant in Chicago.)

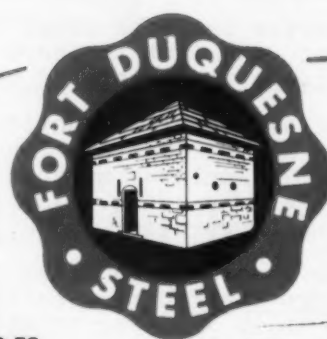
► A relatively new development promises to cut construction time and fabricating costs on heat exchangers. It is an electronic tube expander that cuts off automatically after reaching a predetermined torque for each tube expansion. This cuts out the need for judgment on the part of the operator and speeds up the work.

► The best is none too good in the way of machinery and equipment bought with ECA funds. Only top quality brand new equipment is bought by ECA nations, though many American firms buy a lot of good used machinery.



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Steel Will Absorb Coal Costs

Coal Crisis Took Severe Toll

Scrap Market Shows Strength **IRON AND STEEL INDUSTRY TRENDS**

The Iron Age

SUMMARY

THERE will be no increase in steel prices because of the boost in coal wages. The new coal agreement means that coal this year will actually cost the steel industry less per ton of finished steel than it did in 1949.

Last year the steel industry had about \$50 million added to its coal cost by John L. Lewis' devious stratagems—the three-day week and the need to build huge reserves of commercial coal. This added about \$1.00 on an annual basis to the cost of each ton of finished steel produced. The new coal contract will add somewhat less than \$1.00 a ton to finished steel costs.

This week the nation's industries are breathing a sigh of relief and preparing record breaking production schedules. This coal crisis was a real squeaker. Nowhere is the narrow escape from disaster more dramatic than in the steel industry.

Coal Crisis Took Severe Toll

Steelmen had gambled on an early resumption of coal mining. Throwing their historic caution to the winds, they kept their furnaces operating long after their dwindling coal stocks had shrunk past the danger point. Last week, when the ingot rate plummeted to the low seventies, it looked as if they had lost their bet. Now they will be praised for their courage and good judgment—until they guess wrong.

Although the catastrophe which would have become inevitable this week was averted, the coal crisis still took a severe toll. In the steel industry loss of production will total about a million tons. If this lost production had been turned out in the proper items it would have been sufficient to build approximately 150,000 typical six-room houses. Moreover, an automobile could have been turned out to go with each house. Then there would have been enough steel left to furnish each of the 150,000 homes with a range and a refrigerator.

More than 400,000 tons of the million-ton steel loss can be attributed to last week's operations. If the coal impasse had continued the weekly loss would have zoomed well over half a million tons.

Within two weeks the loss would have been at a rate of more than a million tons a week.

This week steel production is scheduled at 73 pct of capacity, unchanged from last week's revised rate. Some companies will bounce back with a high operating rate almost at once. For others, it will be more than a week before they start receiving coal from the mines. Meanwhile, they can dig into the reserves they had to hold to insure against damaging their furnaces. But within two weeks the operating rate should be back in the nineties again.

Curtailed Power Cut Production

Among steel consumers, power curtailments caused more loss of production than lack of steel. In the Chicago area power restrictions had already forced most manufacturers to a three-day-week basis. This reduced their consumption of steel and left them with some inventory which they can now use to resume full production.

In the Detroit area, production losses have been light, excluding the Chrysler strike. Although some overtime has been eliminated, the other auto companies have maintained a high rate of output. The race for market among the automakers is one of the strongest factors supporting the tight steel market—especially in cold-rolled sheets.

Scrap Prices Are Stronger

Some steelmakers now believe that the strong demand for steel will continue into the third quarter. This looks like a good bet, although it will take a few weeks to sort the strike-hedge orders from the good orders which were placed during the coal crisis. If the appliance makers and auto people are guessing right 1950 will be better than 1949—for themselves, as well as steel.

In steelmaking scrap the major interest was in shoveling turnings. Mills were actively buying this grade to sweeten blast furnace charges and boost pig iron output quickly. No. 1 heavy melting steel was a little stronger in Pittsburgh, where it recouped the \$1.00 a ton it lost last week. This advanced THE IRON AGE steel scrap composite price by 34¢ a ton to \$27.42 per gross ton.

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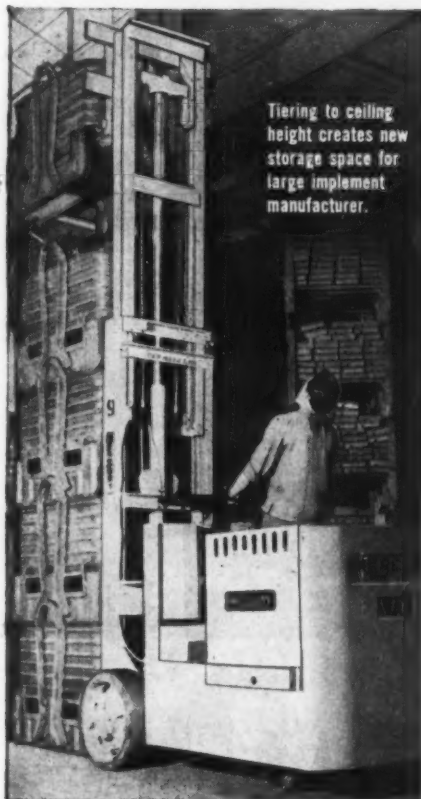


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TRACTORS TRAILERS LIFT TRUCKS



Fatigue Cracks

By *Charles T. Post*

For Pete's Sake

One thing the coal freeze turned up was a subconscious desire of the householder to get out of the rut of converting from coal to oil and oil to coal ad infinitum. Every time John L. Lewis kicks up his heels, there is a surge of coal to oil conversions. It takes no more than a war or a couple of quick squints at the rising oil bill to send the harried householder running around the squirrel cage in the other direction.

Unless you live in California or the Southwest, natural gas is not a very certain escape. And the forests are limited unless you retreat to the wilderness. But Representative Marshall (D., Minn.) thinks he has found another way out, as evidenced by a bill introduced a couple of weeks ago in Congress.

For only \$3.5 million, he thinks, we could develop a perfectly dandy source of fuel in the country's peat. That is, for \$3.5 million we could look into the matter, and thumb our nose at John L. The congressman didn't say so, but he may have considered the appropriateness of fining the mine workers to raise the money.

Probably the only natural resource that doesn't appear on the potential shortage list is coal. There's enough to last a few hundred years, but if the Lewis henchmen won't mine it, we'll burn peat. That will show 'em. Show 'em, that is, until John L. organizes the peat cutters. Then back to the squirrel cage, Congressman.

Mail Bag

Yesterday's mail brought a request from the FasTite Strap Co.

of Des Moines for a back issue of your f.f.j., containing an article of interest. The letter was like a thousand others until the final paragraph:

"... I am running a business on physical fortitude and woman's intuition. After having fought the steel situation for 4 years, if I can't make any money from the manufacturing end, I think I would be able to write a book about it that might sell. (But it wouldn't go through the mails, I'm afraid.)"

It was signed "Helen L. Nelson."

There's nothing new about physical fortitude being requisite to dealing with the bumps in steel supply. But that crack about woman's intuition being a helpful ingredient caught our fancy.

Possibly it would be a great thing for steel users to fire the market research analysts, expeditors and bird doggers; leave the trade papers unopened; and instruct the receptionist to hang out the "in conference" sign to steel brokers. Purchase programs would be decided wholly upon the advice of the vice-president in charge of intuition—a woman, naturally.

It would be interesting to examine the qualities needed for the job—whether blondes do better than brunettes; maidens than matrons; sweet young things than old battle axes. Most of all, we'd like to know whether experience sharpens or dulls intuitive qualities. If our reader from Des Moines covers these points in her book, we'll guarantee it will sell. If the mails won't handle the inside story on how woman's intuition works, we'll warrant that the males will walk all the way to Iowa to pick up their copies.

Turn to Page 149



How ~~CROSLEY~~ "Traded-In" Speed Nut Savings for Better Shelvador® Design

The 1950 Shelvador has been dressed up for even greater "buy-appeal" in 1950.

Crosley Division of AVCO Manufacturing Corporation has replaced riveted aluminum shelves with streamlined, gleaming plastic attached with Push-On SPEED NUTS—at no extra cost!

The assembly is now done by hand rather than machine, and the higher unit cost of the im-

proved shelves is completely offset by a 49 percent *SPEED NUT* savings.

You, too, can capitalize on savings from SPEED NUT brand fasteners. Ask your Tinnerman representative for details. Also write for booklet, "SPEED NUT Savings Stories". Tinnerman Products, Inc., 2040 Fulton Road, Cleveland 13, O. In Canada: Dominion Fasteners Limited, Hamilton.

PREVIOUS METHOD—Two-piece aluminum shelves assembled with four rivets. Disadvantages: Conspicuous rivet heads; machine assembly; extra material handling.

NEW METHOD—Plastic shelves with integral studs fastened with six Push-On SPEED NUTS. Advantages: SPEED NUTS concealed; hand assembly; less material handling. Three smaller Push-Ons hold name plate, two tubular SPEED CLIPS attach shelf identification plates. Entire Shelvador section assembled with 45 SPEED NUTS in all.

Speed Nuts

Iron Age

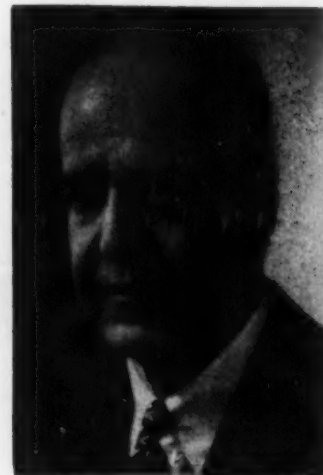
Introduces



THOMAS W. LIPPERT, general manager, Titanium Metals Corp. of America.



T. R. FARLEY, general manager, Caterpillar Tractor Co.'s new plant near Joliet, Ill.



NEIL C. HEAD, a director, Warren Foundry & Pipe Corp.

Thomas W. Lippert was appointed general manager of **TITANIUM METALS CORP. OF AMERICA**. The new enterprise, located at 60 E. 42nd St., New York, is jointly owned by the **NATIONAL LEAD CO.** and **ALLEGHENY LUDLUM STEEL CORP.** and will distribute titanium metal in various forms. Mr. Lippert is a former editor of **THE IRON AGE** and a director of the Chilton Co.

W. M. Hurley, former assistant works manager, has been appointed works manager of the East Alton plant of **OLIN INDUSTRIES, INC.**

Edward C. Manix became manager of the South Deerfield, Mass., branch of **NICHOLS WIRE & ALUMINUM CO.**, Davenport, Iowa.

T. R. Farley, vice president of **CATERPILLAR TRACTOR CO.**, Peoria, Ill., has been named general manager of Caterpillar's new plant to be located two miles southwest of Joliet, Ill. From 1940 to 1946 Mr. Farley served as a top executive with the Caterpillar Military Engine Co.

S. D. Clarke, Jr., has been named purchasing agent of **KEROTEST MFG. CO.**, Pittsburgh. Mr. Clarke replaces **E. T. Adams**, who has been appointed district manager of the Houston sales territory.

Carl T. Doman was appointed national service manager for the **FORD MOTOR CO.** Scope of the department will be broadened to include additional functions.

Neil C. Head was elected a director of the **WARREN FOUNDRY & PIPE CORP.** Mr. Head is a partner in the New York firm of **Cahill, Gordon, Zachry & Reindel**.

Jack H. Eichler was added to the staff of the Boston office of the **RELIANCE ELECTRIC & ENGINEERING CO.**, Cleveland. In his new work as a field sales engineer, Mr. Eichler will report to **Leon M. Dunning**, Boston district manager.

Arthur Grund, for nearly 14 years turn foreman at the blooming mill, has been appointed assistant superintendent of rolling mills at the **Indiana Harbor Works of the Youngstown Sheet & Tube Co.**

Iron Age *Salutes*

DAVID AYR



ROBERT C. TYSON, comptroller,
U. S. Steel Co.

Robert C. Tyson has been named comptroller of the U. S. STEEL CO. He had been assistant comptroller of the corporation since 1947. The position of comptroller was vacant for a number of years, the duties being performed by Enders M. Voorhees, chairman of the finance committee.

W. G. Felton becomes assistant general traffic manager, with headquarters in the Grant Bldg., Pittsburgh for the PITTSBURGH STEEL CO.

Byron E. Snow was appointed sales engineer in the Chicago territory, which includes Illinois, Iowa and southeastern Wisconsin, for AERO-QUIP CORP., Jackson, Mich. His headquarters will be in Lombard, Ill.

Turn to Page 120

ASK Dave Ayr why today he's president and general manager of Hendey Machine Co. and he will say with conviction, "Because I was an apprentice and I know how things ought to be done in the shop."

Show him a part, and he knows how it should be machined. Show him a machine, and he knows how it should be operated, and can operate it himself. To this day, he can and does go into the plant and demonstrate to an operator how a job ought to be done.

When a bonny lad of 19, it was Providence that brought Dave to the United States and into the machine tool industry. He had a brother in Providence. Upon paying him a visit he promptly entered a shop apprentice training course at Brown & Sharpe Mfg. Co.

Then came opportunity. The Pierce-Arrow Buffalo plant was tooling up for production. They sent for Dave Ayr: "We've got nothing but bicycle builders here. We need some young fellow who knows how to set up machine tools."

During the first World War Dave was works manager of the Buffalo plant, Russell Motor Car Co., Toronto. After the war he became vice-president and general manager of Russell Gear & Machine Co., Toronto. In 1924 he joined Pratt & Whitney Div. of Niles-Bement-Pond as works manager.

At the bottom of the depression in 1932 Dave was elected president and general manager of Hendey Machine Co. In his own words: "Our company, like everybody else,



needed business and money. What to do was certainly a problem. I sought the advice of older men in the industry; men like Philip Bliss, then president of Warner & Swasey, Henry Lucas, founder and president of Lucas Machine Co., and William A. Viall, vice-president of Brown & Sharpe Mfg. Co. I presume that's one reason why I have always been so enthusiastic about the value of the National Machine Tool Builders' Assn." [Dave is president of NMTBA.]

As a result of his own background, he is solidly behind apprentice training courses, such as those recommended in the association's newly published apprentice training book.

But he doesn't believe in all work and no play. Among his favorite hobbies is golf, and he shoots a pretty good game. But it's hard to get details from him—because they might have a bad effect on the odds.

all
new
all
the
way
thru

Buy One



MOTOR STARTERS
with the

'Strongbox' Magnet Coil

All the best features in popular sizes for motors to 50 hp. See for yourself. Get a new General Electric Motor Starter. Get out your screwdriver. And get the facts. Make your own comparison on these big ALL-NEW features:

STRONGBOX MAGNET COIL—Coil is locked in a tough block of plastic.

NEW ARC HOOD—Molded, burn-resistant arc hood snuffs arc immediately.

NEW CONTACTS—Large silver contacts with plenty of contact pressure give long life. Convertible from normally open to normally closed in size one and smaller—without additional parts.

NEW MAGNET—Quick direct action, large striking surface.

EASY TO INSTALL—EASY TO MAINTAIN—See how easy it is to get at the ALL-NEW General Electric starter. Note, too, that it's built to take the punishment of day-in, day-out use with a minimum of maintenance. Check the wiring space inside the case. Check the terminal clamps that make installation fast. Check the ease with which controls can be inspected.

DESIGNED FOR FAST ACTION—BUILT FOR LONG LIFE—From the tough STRONGBOX magnet coil to the high strength arc hood, all parts of the new General Electric Motor Starter are built to last. In the revolutionary G-E design, the plastic coil enclosure also serves to guide the armature. For fast, positive action the tough plastic block is impregnated with a permanent lubricant—molybdenum sulphide. Channel-reinforced magnet guides slide smoothly for quick action at all times. Bimetallic thermal relays give swift protection.

GENERAL  **ELECTRIC**

You'll Find It Really Easy with 32 ALUNDUM Grinding Wheels

And Here's Why . . .

4 to 6 Times Faster Cutting

In plant after plant they are finding that the extra sharpness of 32 ALUNDUM wheels and their greater number of cutting points enable them to remove stock from high speed steel and cast alloy tools at rates from four to six times faster per pass than with other abrasives. That means a big saving in tool grinding costs.

Less Dressing

And "32" wheels stay sharp longer. That's because there are more cutting points doing the work and points that don't dull quickly because they are over 99% pure fused alumina. You can go all the way around even a large multi-tooth cutter without having to stop and dress a 32 ALUNDUM wheel. This is another big cost saver.

Less Tool Spoilage

"32" wheels cut so cool that there's far less spoilage of heat-sensitive high

speed steels—even with inexperienced operators. That's because grinding heat is spread over more cutting points and points that are sharper, that penetrate high speed steels more easily.

There's Also "38" and "57"

Some of your tool grinding jobs may be such that "32" is not the recommended abrasive but you can be sure that there is a Norton abrasive with just the right characteristics to give you maximum economy. It may be 38 ALUNDUM abrasive, the original white abrasive and a tool room favorite for 40 years. Or it may be 57 ALUNDUM abrasive which combines a fast cutting action with great toughness and thus is widely used for off-hand tool grinding operations. And these are still further supplemented by regular ALUNDUM wheels and 19 ALUNDUM wheels.

Let a Norton abrasive engineer or your Norton distributor show you that it's no trick to save money in your tool room when you use the right Norton wheels for each job. And send for "A Handbook on TOOL ROOM GRINDING"—162 pages of practical information. Just write for Form 835-D-3

W-1285



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GLOBAL LETTER

REVIEW OF WORLD MARKETS

U. S. and British negotiations for long term tin contract break down because of price disagreement . . . McCloy denies lifting of West German steel embargo.

London — Negotiations between the United States and Great Britain for a long term contract for Malayan tin have bogged down. The U. S. Bureau of Federal Supply initiated negotiations about a year ago to insure the American stockpiling program of an adequate tin supply.

Recent discussions in Washington failed because both sides could not agree on prices. American authorities wanted to buy tin at a 3¢ per lb discount. This would mean buying at 71½¢ per lb against the current New York RFC price of 74½¢. Although the British are interested in getting rid of government tin stocks, the price was too low for them to consider.

The only way the British could give the discount would be if they interfered with the recently freed tin market or by buying at the market price and reselling to the United States at a lower price subsidized by British taxpayers.

Differ on Price Fixing Market

Other difficulties also arose to prevent both sides from reaching a settlement. The choice of a market to be used for price fixing could not be decided upon. New

York was suggested by the Americans, while the British felt that it was too new a tin market to accurately reflect fluctuations in supply and demand. The British suggested Singapore because it is well organized and has had long experience in dealing with tin.

Some quarters feel that the United States will obtain the discount price by periodically staying out of the market long enough to depress the price. It is doubtful if the United States would want to depress the price sufficiently to cause unrest and unemployment in Malaya, but pessimists fear that periodic instead of contractual purchases may put tin producers at the mercy of the U. S.

Deny Lifting of Steel Embargo

Frankfort — The West German steel embargo on shipments to eastern Germany has not been lifted nor does it look like it will be in the near future. This was announced by John J. McCloy, U. S. High Commissioner in Germany. The announcement that the embargo had been lifted was apparently made without his knowledge or the other Western Allied officials.

Reports of the embargo suspension occurred when negotiators of the two German governments issued a report that an agreement has been reached concerning East-West trade difficulties. Apparently they had done so without the approval of the High Commissioner.

No permits for new steel deliveries have been issued, according to reliable sources. The transportation of 1000 tons of steel daily to Eastern Germany was explained by Western Allied officials as representing deliveries that had been agreed to before the embargo was levied on Feb. 8.

Chinese Reds Get Steel Rails

Meanwhile, the authorization of a small delivery of German steel rails to Communist China is not to be considered as policy or precedent, according to Mr. McCloy.

Chinese Communists had contracted originally for 87,500 tons of steel rails from Western Germany. When the Western Allied Command refused to sanction the fulfillment of these contracts, widespread protests in the German press implied that the British wanted these contracts for themselves. Finally, the delivery of 15,000 tons was permitted, although Mr. McCloy made it plain that he had joined in the decision only in that specific case.

Turn to Page 165

These Two Valuable "Tools" of V-BELT DRIVE Design and Application



...are **Yours** for the **Asking!**

The Gates "GUIDE for SELECTING or DESIGNING V-BELT DRIVES" is widely recognized as the most *comprehensive* and *complete* book of its kind—and also the *easiest* to use. It enables you to find all the possible combinations of stock drives for your machine with the *least amount of calculation*—and almost *automatically* gives you the drive of *lowest price* that will be adequate for the job.

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The Gates "INDUSTRIAL NEWS," published monthly, gives interesting "case histories" of V-Belt drive installations designed and used by practical operating men and engineers. These case histories are selected from thousands of applications. Among other things they show—what can be accomplished with V-Belts—how to install various drives—unique applications—unique uses—examples of savings—and other valuable "how-to-do" ideas.

You Can Design ANY Drive

The Gates GUIDE tells *when* you can use a V-Flat drive—and gives you a simple way to choose a practical V-Flat design using *stock driver sheave* with whatever flat pulley you may already have on hand.

As a matter of fact, by using the Gates GUIDE you can design—with a *minimum of calculation*—any kind of V-Belt drive for every kind of operation—including quarter-turn drives and Dubl-V drives.

Written By GATES Engineers

The GUIDE is compiled and written by Gates Engineers. It embodies their specialized knowledge gained through operating the largest V-Belt testing laboratories in the world! Here, an average of *32,000 hours* of testing *per week* are run on V-Belts alone! No wonder the Gates "GUIDE for SELECTING or DESIGNING V-BELT DRIVES" is regarded by Engineers as the *authority* on V-Belt Drive design.

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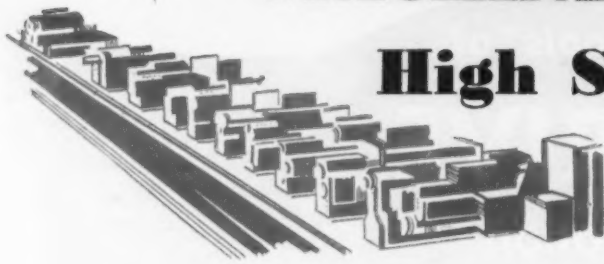
Position Held _____

Name of Firm _____

City _____ State _____

MACHINE TOOL

High Spots



Sales
Inquiries
and Production



by

William A. Leach

**Chrysler, coal strikes
haven't stopped tool indus-
try, yet . . . India considers
building new tool plant.**

Cleveland—In Detroit the accelerated tempo in the new machine tool industry is continuing despite the Chrysler strike and the recently ended coal strike.

During the past fortnight Ford has made some requests for quotations on its new high compression V-8 engine. Up to the present time, however, no placements have been made, according to informed sources.

Tool Room Buying Reported

Meanwhile, ordering for the new Ford-Cleveland plant is continuing and it is now anticipated that orders for zinc die casting equipment for the Monroe plant will be a subject of discussion in the near future. Present indications are that the Kelsey-Hayes move from Monroe will be completed within the next week or two. Some delays in delivering Ford equipment to the new Buffalo press shop have been reported due to inclement weather conditions.

Chrysler plans appear to be crystallizing around production of the present engines at the rate of 45 per hr at the DeSoto plant. Chrysler-Jefferson plans have been slowed up by the strike but are believed to be built around 20 per hr of the new high compression V-8 engines.

There has been some buying here of equipment for tool rooms, including the Ford-Cincinnati transmission plant, Fisher Body and AC Spark Plug Division. With few exceptions, buying by small shops has been spotty. In particular, shops supplying Chrysler have been hard hit by the strike, according to the trade.

Net earnings of \$3,518,575 after taxes have been reported by Ex-Cell-O Corp., Detroit, for the year ending Nov. 30, compared with a net income of \$2,498,638 in the previous year. Earnings per share were \$8.26 compared with \$6.26, according to Phil Huber, president. Ex-Cell-O reported a substantial increase in consolidated net sales as well as improved income from leased machines during 1949.

Machine Tool Plant for India

Elsewhere, a proposal by the Indian Government to establish a machine tool plant at Mysore, which will eventually build about 80 pct of all the machine tools required by India and employ 10,000 men, has been the cause of considerable comment.

Plans call for a plant costing from \$36 million to \$45 million and managed by Oerlikon Co., a Swiss firm.

Production is supposed to include

general purpose and tool room lathes, universal turret, and turret lathes, radial drills, vertical drilling machines, shapers, planers, universal boring mills, all types of milling machines, all types of precision grinding machines, presses, gear shaping and hobbing machines, forging machines, and die sinking machines.

Critics brand the proposal as fantastic, which is not difficult to understand. How Oerlikon came into the picture, however, is a mystery. Oerlikon builds light machine tools and special machines for light ordnance plants.

Facts of the case appear to be, first, that the Indian Government does not realize that modern machine tools cannot be built by unskilled labor, and that Indian machine tool builders, of whom there are a few, cannot be expected to reach the required accuracy for some years. Also, it is apparently not understood that no one company in either the U. S. or Great Britain attempts to build a complete range of machine tools, or that large numbers of U. S. machine tools are purchased in Great Britain, despite the fact that the British machine tool industry has been established on a firm basis.

National Acme Income Drops

In Cleveland, National Acme Co. reported net income of \$1,275,437 for 1949, after an estimated provision for Federal income taxes of \$800,000, compared with 1948 net of \$1,505,018.

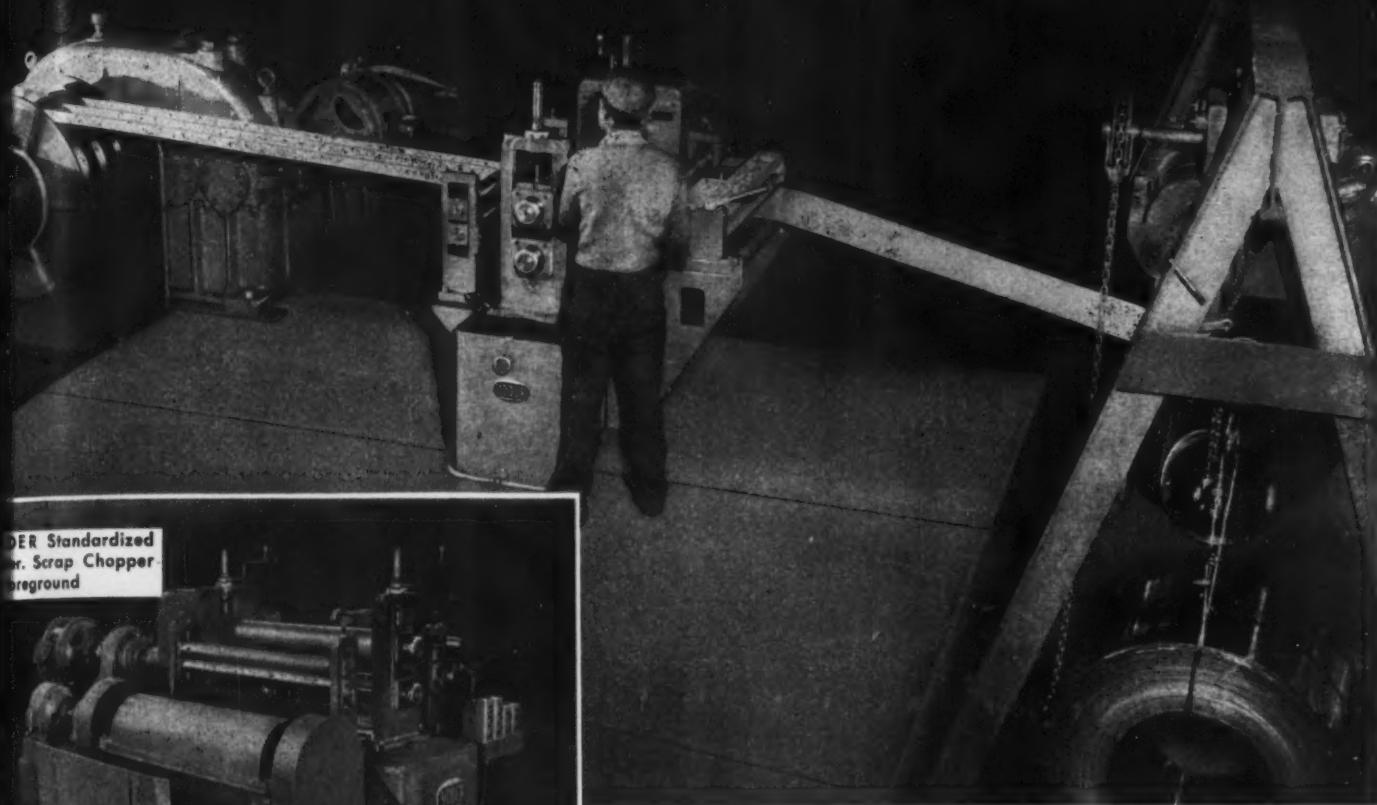
Foreign orders tapered off "very precipitately during the latter part of the year, due for the most part to devaluation of currencies throughout practically all foreign countries, Fred H. Chapin, president of National Acme Co., pointed out in his letter to shareholders.

In addition, the shortage of dollars and political restrictions will make it extremely difficult to procure foreign machine tool orders for a long time in the future.

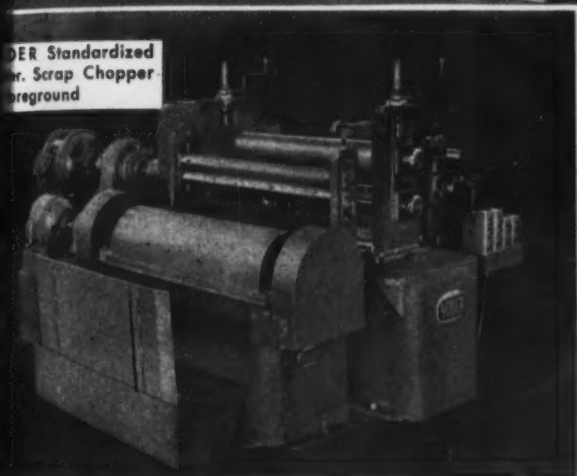
National Acme is giving serious consideration to expansion of manufacturing facilities abroad.

The business outlook for 1950 promises "normal continuation for at least the first six months, based on the present backlog of orders," Mr. Chapin stated.

Production of 40 tons per day
on slit strands is not unusual



Yoder Standardized
Scrap Chopper
in foreground



Works only One Day a Week

... **... YET EARNS A GOOD LIVING!**

ANY WORKMAN who could do that—well, maybe there never was such a man, but there certainly is such a machine—the Yoder Rotary Gang Slitter for coils and sheets.

Figure it out for yourself and you will see how it may easily "earn its keep" and pay for itself in jig time, on less than 20% operation. With an experienced crew of two or three, a daily production from 20 to 140 tons is possible. With just a medium size Yoder slitting line and average size coils, forty tons per day is not at all unusual.

At the prevailing rate of one-half cent per pound for slitting service, not counting size extras, this would

mean yearly earnings of about \$20,800.00 working only one day per week.

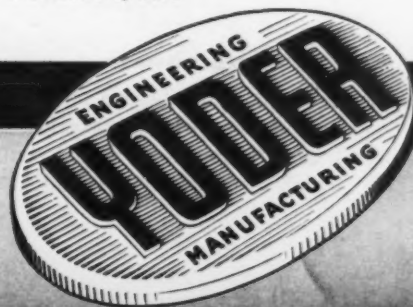
Yoder standardized series of slitting line units (uncoilers, slitters, scrap choppers, recoilers) offer the greatest values for your money—in capacity, output, convenience, accuracy, and stamina. If you use, handle or sell over 1000 tons of sheet and strip per year, a Yoder slitter may not only be highly profitable, but a great convenience besides. For special needs, slitting lines built to order.

Consultations, Estimates and Recommendations. 76-page Slitter Book for the asking.

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Complete Production Lines

COLD-ROLL-FORMING and auxiliary machinery
GANG SLITTING LINES for Coils and Sheets
PIPE and TUBE MILLS—cold forming and welding



FREE

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PUBLICATIONS

Bladeless Impeller Pump

A new type of sewage and trash pump having a bladeless impeller is shown in a 16-p. bulletin listing construction details, principal dimensions, specifications, power modifications and selection tables for the vertical and horizontal models. *Fairbanks, Morse & Co.* For more information, check No. 1 on the postcard.

Stock Fastenings

A quarterly stock list contains 18 p. listing about 7000 items of brass, bronze, Monel, copper, stainless steel and aluminum fastenings with various finishes. *H. M. Harper Co.* For more information, check No. 2 on the postcard.

Furnaces and Kilns

Heat treating, melting, research and sintering furnaces, metallurgical tube furnaces, and ceramic kilns are shown in a 4-p. folder on Pereco equipment. *Pereny Equipment Co.* For more information, check No. 3 on the postcard.

Horizontal Boring Mills

Unusual operations of Gilbert horizontal boring mills are illustrated in an 8-p. bulletin showing 19 varied applications and describing the particular equipment used. *Cincinnati Gilbert Machine Tool Co.* For more information, check No. 4 on the postcard.

Squaring Shears

The line of Niagara power squaring shears, with capacities up to 1 in., are shown in a 38-p. bulletin, which also describes in detail some

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

of the special features incorporated. *Niagara Machine & Tool Works.* For more information, check No. 5 on the postcard.

Hydraulic Equipment

Pumps, motors, valves, single and multiple sleeve cylinders, and manually operated units in a wide range of capacities are shown in an 8-p. catalog. *Commercial Shearing & Stamping Co.* For more information, check No. 6 on the postcard.

Wear Resistant Steel

Case histories of the use of Jallo steel for applications requiring high abrasion and impact resistance are presented in a 36-p. brochure giving technical data, and tables on chemical composition, grain size and physical properties of this new alloy steel. *Jones & Laughlin Steel Corp.* For more information, check No. 7 on the postcard.

Machine Tools

A large listing of used and rebuilt machine tools, representing a portion of more than 2000 machines ready for immediate delivery, is presented in the illustrated Emerman "50" Red Book, which also outlines a machine tool rental plan for this unconditionally guaranteed

equipment. *Emerman Machinery Corp.* For more information, check No. 8 on the postcard.

Cotters

Specifications for standard external and internal Hair Pin cotters are given in a 4-p. folder also listing a number of special cotters and their applications. *M. D. Hubbard Spring Co.* For more information, check No. 9 on the postcard.

Arc Welders

Descriptions and specifications for a variety of Airco AC transformer and DC generator welders for any operations are presented in a new 36-p. catalog. *Air Reduction Co., Inc.* For more information, check No. 10 on the postcard.

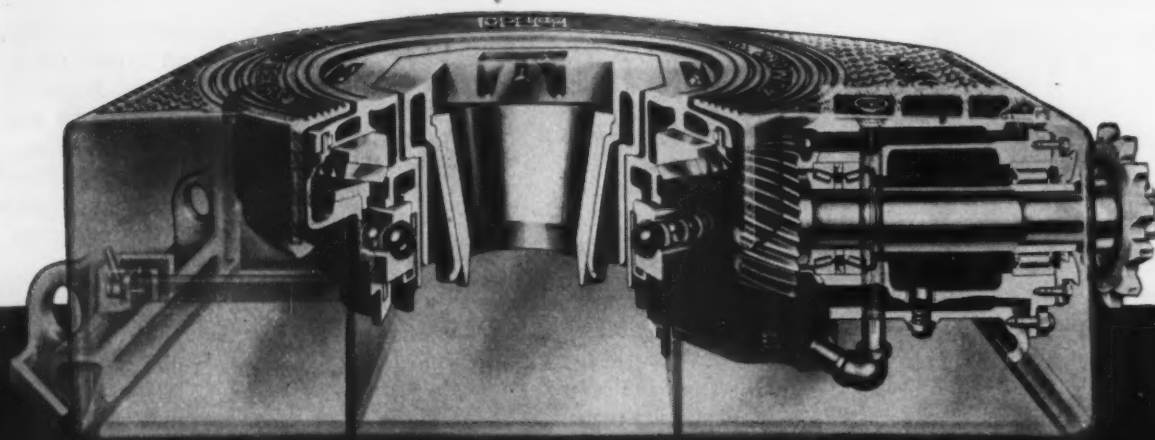
Steel Strapping Tools

All the materials, tools and accessories used to apply Acme Steel strap and Unit-Load band to any type of shipment are described in a 16-p. illustrated catalog. *Acme Steel Co.* For more information, check No. 11 on the postcard.

Blowers

Publication No. 86 is a handy selection chart that lists the various capacities possible in the Stand-

Turn to Page 130



KAYDON ANGULAR THRUST BEARINGS — USED ON ROTARY TABLES OF OIL DRILLING RIGS

CONTACTING KAYDON was the RIGHT IDEA for IDECO*

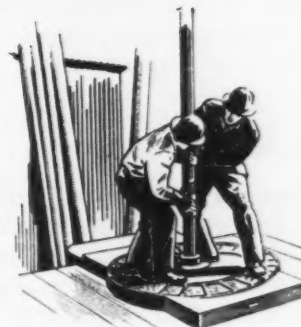
No manufacturer of heavy-duty machinery can afford to compromise on bearings, the very heart of efficient operation... particularly in powerful oil field rotary tables where the tremendous loads demand super-rugged, high precision bearings.

IDECO is one of many of America's outstanding machinery builders who find KAYDON Bearings are right! On the 14½" IDECO Rotary Table for Drilling Rigs 22.750" OD bearings are used... the 17¼" IDECO Streamlined Rotaries use bearings 29.250" OD...

*International Derrick & Equipment Co.
— One of the Dresser Industries

the 23", 36.000" OD bearings... the 27½", 39.625" OD bearings... big, rugged, but smooth and reliable in performance as a fine watch movement!

Other heavy machinery engineers also find it's the right idea to "Contact KAYDON" for bearings that more than meet the demands of steel mill and paper mill machinery, excavators, loaders, cranes, hoists, crushers, food processing and all types of heavy-duty equipment.



KAYDON Types of
Standard or Special
Bearings:

Spherical Roller
Taper Roller
Ball Radial
Ball Thrust
Roller Radial
Roller Thrust

Counsel in confidence with KAYDON. Capacity now available for all sizes and types of KAYDON Bearings.

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

All types of Ball and Roller Bearings 4" bore to 120" outside diameter

March 9, 1950

NEW

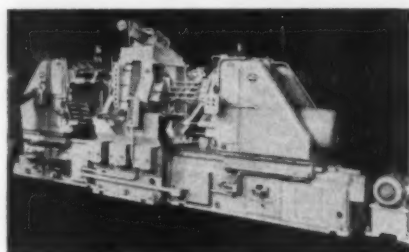
PRODUCTION IDEAS

Continued

72 kw. The heated section of the oven is 3 ft long and the conveyer moves at 5 fpm. As the parts move between the heater banks, the temperature rises and vaporizes the oil coating. The oven has a heatup time of 2 min. *Edwin L. Wiegand Co. For more information, check No. 31 on the postcard on p. 35.*

Multi-Driller

The new automatic hopper feed multi-driller has been built for the machining of piston pins. A central fixture has heads sliding on bed ways from opposite side. Op-



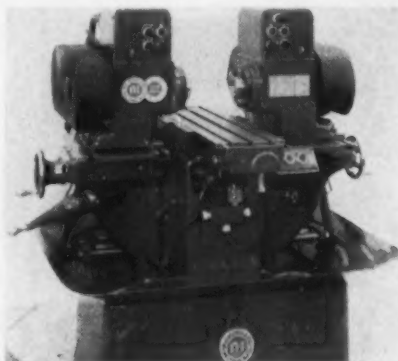
erations are accomplished automatically, with hopper feed and automatic loading, clamping, unclamping and ejecting. The machine is push-button operated and goes through automatic cycles of operation to drill, chamfer, rough and finish ream 575 piston pins per hr. *National Automatic Tool Co. For more information, check No. 32 on the postcard on p. 35.*

Tool Protection Unit

Protectron is an industrial tool designed to protect tools, dies, and machinery against breakage due to mechanical overload. When the mechanical load upon the machine increases to the degree preset above normal, whether infinitely minute or wide in range, Protectron will trip and automatically actuate control devices to prevent damage before it occurs. The device is said to reduce breakage and operating overhead, to enforce tool sharpening by detecting dullness and to protect machinery against piece-work abuse. *Brinnell Co. For more information, check No. 33 on the postcard on p. 35.*

Twin Mill

Increased production at lower costs in milling small parts is claimed for the new Nichols Twin Mill that mills two or more surfaces simultaneously. The machine lends itself to many high production applications, but can be

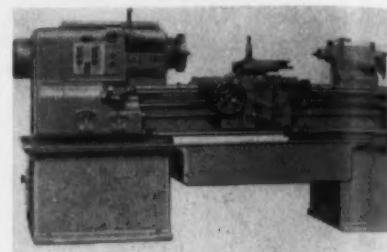


speedily adapted to short-run work. Two independently geared head milling units are mounted opposite each other on the knee and saddle assemblies of conventional design. The machine table reciprocates automatically between milling heads. Each milling head is V-belt driven by its own motor providing a selection of 15 spindle speeds in geometric progression. Lower speeds are secured through gearing; higher speeds through direct belt drive. Complete push button control system provides for operation of each milling head independently or in unison, forward or reverse. *Nichols-Morris Corp. For more information, check No. 34 on the postcard on p. 35.*

Heavy Duty Engine Lathes

More and higher speeds are offered in a new series of heavy duty engine lathes that includes 12, 14 and 16-in. swing sizes with 24 spindle speeds, and a 20-in. size with 32 spindle speeds. A maximum of 1250 rpm is attained in the 12 and 14-in. machines. The new lathes are arranged for higher powered motors than previous models. An enclosed quick change

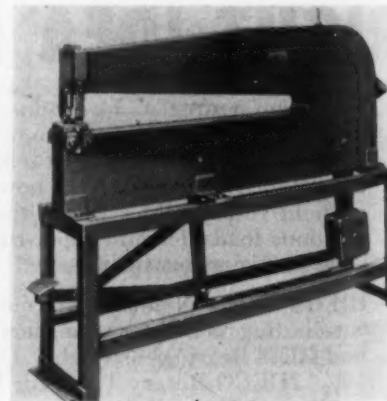
box is automatically lubricated. Sixty feed and thread changes are obtained through hardened alloy steel gears; shafts are supported on anti-friction bearings. The headstock utilizes the LeBlond free-running principle; any gears not actually in use in any given speed



are cut out of the gear train, and put no load on the motor, thus leaving more of the main drive motor horsepower free for cutting. The compensating V-way principle has been retained on the bed which is fitted with replaceable hardened and ground steel bed ways front and rear. The line also includes 25, 32, 40 and 50-in. heavy duty engine lathes. *R. K. LeBlond Machine Tool Co. For more information, check No. 35 on the postcard on p. 35.*

Punch Press

The foot press illustrated has a 4-ft throat depth and was built to punch holes along the edges of standard 4-ft sheets of hard, compressed composition board. The Whitney-Jensen line of foot presses



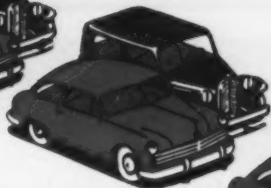
includes 7, 10, 18 and 24 in. throat depth presses. They are all-steel-welded construction with a frame cut from heavy steel sheet and a sturdy stand fabricated of angle iron. The punch is operated by a pedal through a lever and toggle

Turn to Page 134

3

WILL GET YOU

4



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HIGH-TENSILE STEEL

MAKE A TON OF SHEET STEEL
GO FARTHER

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Corporation

N-A-X Alloy Division, Ecorse, Detroit 29, Mich.
UNIT OF NATIONAL STEEL CORPORATION

March 9, 1950

It's a fact. It's demonstrated every day, in the production of varied parts and products. *Three tons* of N-A-X HIGH-TENSILE steel are yielding as many finished units as were yielded formerly by *four tons* of carbon sheet steel!

This "new arithmetic in steel" is in step with industry's trend to the use of improved steels. When cold-rolled steel was found to be preferable to hot-rolled for many uses, industry substituted cold-rolled for hot in these uses. Today, it is equally logical and economical to replace simple carbon sheets with low-alloy high-tensile.

N-A-X HIGH-TENSILE makes it possible to reduce sections by 25% ... and *still provide* greater strength and durability than can be obtained with thicker sections of mild-carbon steel! Each ton of N-A-X HIGH-TENSILE steel represents a potential 33% increase in finished goods. Manufacturers are finding that N-A-X HIGH-TENSILE enables them to get 33% greater usefulness out of steel supplies.

Investigate this great opportunity to make each ton of sheet steel go farther ... through the superior quality of N-A-X HIGH-TENSILE.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Frameless-type car is red hot subject of discussion in Detroit
. . . New high compression engines are coming—fast . . .
McLouth discloses details of its new Trenton plant.



by

Walter G. Patten

Detroit—There is a continuing interest here in possibilities of unified body-and-frame construction for a passenger car. However, contrary to a number of publicly expressed opinions, there appears to be no clear cut advantage at present for all auto producers in building a unitized car.

Two independent producers—Nash and Hudson—have made a complete shift from frame-type construction to unified body-and-frame construction. This is a costly change to make. Each appears to be well satisfied with the move. However, such a change would not be nearly as easy for General Motors and Ford which have assembly plants scattered all over the country.

The past history of the unified

body-and-frame design is of considerable interest. Nash made the change ten years ago and is sticking to this design, both on the present line of cars and the new light models to be introduced next month. It will be recalled that Hudson made the change in its postwar car.

GM has been studying unit construction for years. The GM light car which was abandoned would have utilized a unified body-and-frame. The GM Australian car uses this design, affording the corporation valuable experience should it care to go further with it. At a recent talk in Detroit, J. J. Cronin, manager of Fisher Body, said Fisher is interested in the subject. He did not elaborate on this statement.

While some had anticipated the new Kaiser light car might use this engineering design a conventional frame has been specified.

Has Lowest Center of Gravity

Hudson engineers claim several advantages for Monobilt construction. It is contended the new Hudson is "the strongest, the safest, most rigid, twist-free body-and-frame unit ever built.

Hudson's latest models use a seven transverse frame. Members measure up to 6 13/16 in. in depth and are joined to four longitudinal

members. The outside members or rails completely encircle the passenger area, including the rear wheel area. Body and roof panels are welded directly to these structural body-and-frame members.

By moving the seats forward and lowering the car, Hudson has been able to offer the lowest center of gravity in the industry as well as one of the smoothest riding cars available today.

Nash Claims Extra Advantages

Nash claims several additional advantages for unified body-and-frame construction. This design, it is contended, gives unusual rigidity as well as freedom from body rattles and squeaks. "You'll never have to bother with having the body tightened, as you would on other cars," Nash salesmen tell their customers.

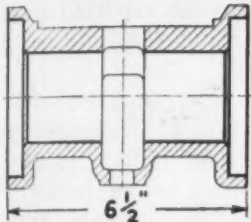
Nash engineers summarize the advantages of this type construction as (1) greater efficiency per lb of material, (2) increased overall stiffness, (3) better riding qualities resulting from increased stiffness. Another advantage, according to Nash engineers, is the elimination of body-to-frame bolts and any shims that may be necessary to take care of production variations.

Meanwhile, frame engineers, fully aware of the claims of unitized body engineers, have been

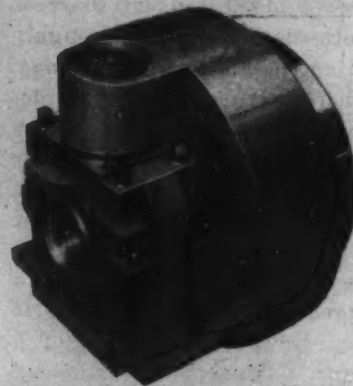
POTTER & JOHNSTON TOOLING

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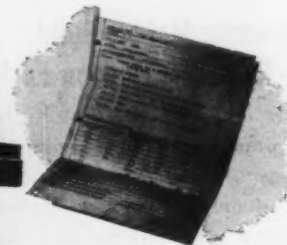
P&J engineered the ingenious tooling for this cast iron Bearing Housing — designed it to complete the rough and finish machining at both ends, a total of 18 operations, in one holding. Eight operations are performed at one end . . . the work is indexed 180° . . . eight operations are performed at the opposite end . . . the full length of the I. D. is then line bored and line reamed. Floor-to-floor time at 85% efficiency is 6 minutes, a feat made possible by P&J experience-engineered Tooling — including the specially designed indexing type work holding fixture — which accounts for combining cuts, avoiding secondary operations, and keeping machining times down to an absolute minimum. Additional savings are realized from the accumulated economies of increased tool life, and from divided labor costs — P&J Automatics are fully automatic, therefore one operator can easily run 3 machines on this class of work.



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P&J-designed
INDEXING FIXTURE

eliminates secondary
operations on the
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5DELX AUTOMATIC

Get the benefits of greater accuracy, better work, more savings, by sending a sample of your work for P&J Tooling Recommendations based on precision, speed, economy. We'll engineer the Tooling, turret face by turret face, and present the facts on this detailed Estimate Sheet, without obligation.



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IN TOOLING FOR

Precision + Productivity + Economy

March 9, 1950

working industriously on the problem. They argue that the difference in weight between the frameless car and the car with separate frame would not be nearly as great if both designs are thoroughly coordinated during design stage. Another argument is that development time and expense seems to be definitely in favor of a car with a frame. They also claim the testing or tryout time for a new model is less. Admittedly, the evidence as to repair costs for a damaged car of each design is vague. However, designers of a car with a frame are claiming an advantage.

No Immediate Change Seen

The only present conclusion that can be drawn on this subject is that all producers are studying the problem very closely. There are no indications of a switch in the near future by any of the major producers.

GM is known to have made a very thorough study of this subject. However, the high cost of scrapping its present tooling plus the tremendous outlay for new tools plus problems incident to producing cars at its assembly plants is likely to delay any change in the basic frame design of its cars for some time to come.

Automobile Makers Build New High Compression Engine

The rush toward new high compression engines is now in full swing. Since the introduction of new overhead valve engines by Cadillac and Oldsmobile, the industry has been beating a path toward V-type eight cylinder powerplants and new in-line six designs with greater rigidity and reduced friction.

Situation Raises Questions

Ford is currently ordering tooling to build a new six-cylinder overhead valve engine at Cleveland. Quotations are being prepared for the necessary tools to build a new Ford V-8 at the Rouge.

Dividend Payments by Selected Industries

(Millions of dollars)

	CALENDAR YEAR	
	1948	1949
Total	6,093.7	6,495.8
Mining	373.6	338.7
Manufacturing	3,391.7	3,691.4
Chemicals	419.7	481.1
Oil refining	549.9	649.4
Iron and steel	346.1	383.1
Nonferrous metals	134.4	117.1
Machinery (except electrical)	276.8	279.1
Electrical machinery	172.9	180.2
Transportation equipment	89.4	76.3
Automobiles	342.8	523.8
Other manufactures	1,059.7	1,000.3
Trade	416.8	424.8
Finance	688.2	770.1
Railroads	269.7	259.7
Heat, light, and power	513.6	559.7
Communications	276.0	303.6
Miscellaneous	164.1	147.8

These figures, compiled by the Commerce Dept., include only publicly reported cash dividends which on an all-industry basis, account for about 60-65 percent of all gross cash dividends paid.

Reports indicate a new Mercury engine and a new Lincoln engine are well along.

Studebaker and Chrysler are also tooling for such an engine. The new Chrysler engine will be built, it is indicated, at the Jefferson plant. Meanwhile, a good share of the present engine building activities at Jefferson will be moved over to DeSoto.

Hudson, Kaiser-Frazer, Willys, Packard and Buick have new post-war engines but not of radically new design.

The present situation raises several interesting questions: Will Packard and Lincoln, for example, bring out V-12 engines in order to shake off Cadillac competition? Will Cadillac, which now has only one engine for four lines of cars, modify its present engine or introduce an additional design? And how soon will Buick, Chevrolet and Pontiac join the rest of the GM family which is using the Kettering-type engine?

The answers to these questions are not available but there are undoubtedly important developments taking place right now that will eventually become significant milestones in automobile history.

Automobile Firms Increased Cash Dividends By One Half

Last year's publicly reported cash dividends (see table) by United States corporations were up 7 pct over 1948, to a total of nearly \$6.5 billion, according to figures compiled by the Office of Business Economics.

Automobile firms paid out half again as much in 1949 as for the previous year, the reported total rising from about \$343 million to \$523 million.

Iron and steel industry dividends recorded a moderate increase from \$346 million to \$383 million. Mining, as an industry, reported reduced payments, dropping from \$373 million to \$338 million.

McLouth Steel Corp. Opens New Plant at Trenton, Mich.

The first official release on McLouth Steel Corp. describing in detail its new Trenton, Mich., plant became available in the annual report to stockholders issued recently.

The report shows that average piling depth for foundations for the new mill was only 22 ft.

The present melt shop consists of four 60-ton electric furnaces having a combined capacity of 400,000 tons per year.

In a building separate from the melt shop are housed soaking pits, blooming mill, hot mill, continuous pickle line, and necessary auxiliary finishing equipment. Facilities here provide for the production of carbon slabs and hot rolled coils for the Livernois Ave. plant.

The entire Trenton plant was constructed in a period of 16 months. The company acted as its own general contractor.

In an average month, McLouth's Trenton plant receives 650 cars of scrap which it manufactures into 28,000 tons of finished hot rolled carbon sheet and strip steel. The plant now employs 670 workers.

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Bearing Housing Assembly forgings. Difficult forgings in which thin sections have been successfully retained. The halves are welded together and machined. Each is approximately 13 inches long, 12½ inches wide, 6 inches high.

Total unfinished weight 146 lbs.



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OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

WEST COAST PROGRESS REPORT



Coal shortage affected western steel producers . . . General contractors expect big year . . . Northwest fuel trends analyzed.

Digest of Far West Industrial Activity



by

J. Reinhardt

San Francisco—With a larger percentage of its steel production depending upon hot iron than ever before, the West last week felt the first real impact of the coal strike just before it ended. Before the war when all steel producers in the West relied upon scrap metal, coal shortages had but little significance to the industry. Now, however, with four blast furnaces normally in production in Utah and two in southern California, the largest percentage of steel produced in the West is made primarily from hot iron.

Geneva Reduced Operations

Geneva Steel Co. had to reduce its entire operations to a standby basis with only a few coke ovens and one blast furnace being kept in operation and with 3000 production workers off the job. Because of a shortage of gas for reheating, rolling schedules were abandoned. This automatically shut off the flow of hot rolled coils to Columbia Steel Co., another U. S. Steel subsidiary at Pittsburg, Calif. However, the latter com-

pany reported that they had ample stocks on hand to keep the re-rolling mills there busy for the rest of this month at least.

Kaiser Steel Corp. at Fontana late last week reported a cut-back in coal consumption to the point where its No. 2 blast furnace had been put on about one-third blast and open-hearth production cut to about 80 pct of capacity. The original No. 1 blast furnace had been out of operation for the past two weeks because of a break-out, the extent of which has not been fully determined. Coking operations had been reduced to a standby minimum and re-heating and openhearth furnaces were scheduled to be operated on purchased gas and oil for the duration of the

curtailment. Output of rolled products is expected to be about 10 pct below February levels. Blast furnace crews had been put on a three-day week.

Daily Payroll Loss Was \$75,000

Between 3500 and 4000 coal miners in Utah who supplied both Geneva and Kaiser were out along with the steelworkers there and it is estimated that the direct payroll loss in Utah was approximately \$75,000 per day.

Western fabricators were generally in good shape and estimated that they could have weathered a strike without serious effects for at least another month. Electric and openhearth furnaces operated by Bethlehem Pacific Coast Steel Corp., Columbia Steel Co., Pacific States Steel Corp. and relying primarily on scrap had been unaffected by reduced pig production.

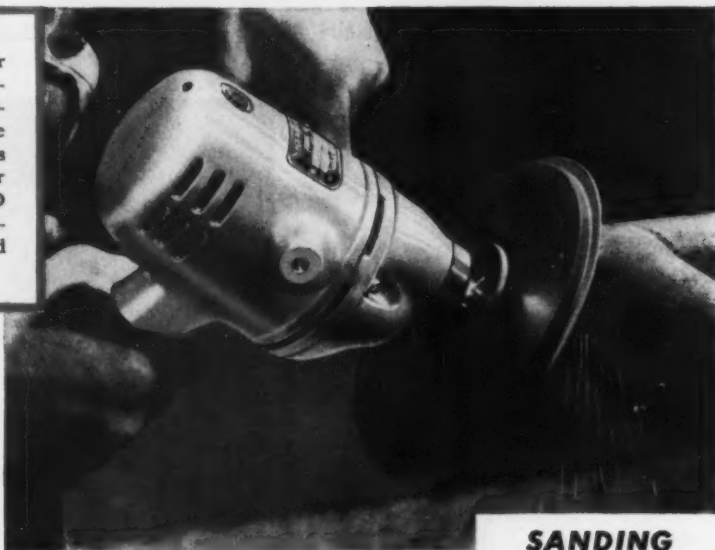
With the steel market in the West generally slow with but few exceptions, the recent contract made by Kaiser Steel Corp. with the Trunk Line Gas Supply Co. for \$33 million worth of 10 $\frac{3}{4}$ -in. to 26-in. diameter pipe loomed up like an oasis on the desert.

New Construction To Increase

The 255,000 tons of steel for this line, which is to run from McCallen, Tex., to Tuscola, Ill., will be made at the Fontana plant of Kaiser Steel Corp. and shipped to Napa, Calif., where the pipe division of Basalt Rock Co. will fabricate it. New equipment at this plant for the production of 22-in. to 30-in. pipe is expected to be operating by about March 15.

More than 1200 members of the

NEW B&D 7" Junior Sander (\$53.00) specially designed for intermittent service. Universal motor in line with spindle and "right angle" handles give it perfect operating control, better balance, greater compactness. Other B&D Sanders for heavier duty include 7" Standard (\$67.00), 7" Heavy-Duty (\$76.00) and 9" Heavy-Duty (\$92.00).



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See your nearby B&D Distributor for full details on their powerful B&D-built universal motors, husky construction, easy handling. Write for free catalog to: THE BLACK & DECKER MFG. Co., 651 Pennsylvania Ave., Towson 4, Md.

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PORTABLE ELECTRIC TOOLS

Associated General Contractors attending their 31st annual convention here last week were informed that the 1950 total volume of new construction and maintenance and repair operations might well approach \$30 billions of dollars as compared to the record volume of more than \$19,500,000,000 in 1949.

Adolph Teichert, Jr., association president and general contractor of Sacramento, Calif., told his members that approximately 50 pct of the total of new construction executed throughout the country last year was performed in this state.

Backlog Seen at \$100 Billion

James W. Follin, special assistant to the administrator of the General Services Administration in Washington, stated that the backlog of accumulated needs for public facilities of all sorts can be estimated as high as \$100 billion.

Edwin G. Nourse, who resigned as chairman and member of the President's Council of Economic Advisors last November, recommended that unemployment figures be closely watched from month to month in the future and pointed out that civilian employment dropped 1½ million from December to January and thus the figure was nearly ½ million below that of 1949. Unemployment has risen to approximately 4½ million as compared with a little more than 2½ million in the previous year. This is about 7 pct of all civilian workers as compared with 4½ pct in Jan., '49.

Boeing Suit Viewed With Interest by Industry and Labor

Seattle, Wash. — Industrialists and labor leaders alike are looking forward with interest to the trial set for June 1 at which the claim for \$9 million damages sought by Boeing Airplane Co. against the Aeronautical Mechanics Union (IAM) will be heard.

This is believed to be one of the largest damage suits of this kind ever filed. The company is suing as a result of the strike called



WESTERN WAYS: Checking the inside electric welding of a 34-in. diameter pipe at the South San Francisco Plant of Consolidated Western Steel Corp. Western methods of fabricating large diameter pipe for transmission of natural gas were studied here recently by employees of the National Tube Co.

against Boeing on April 22, 1948. Federal courts already have ruled that the union called an "illegal" strike, having broken the Taft-Hartley Act by not giving a 60-day notice of its intent to strike.

The union and the company have recently been negotiating to draft a new labor agreement since the original contract was lost as a result of the strike.

Fuel Study Seen Significant

With virtually no large blocks of firm electric power available to industry, the recently completed study on fuel trends in Washington may be of special significance. Maxine Johnson, research assistant at the State College of Washington, who compiled the study, points out that the prospect is for an increase in demand for energy because of the rapidly growing population and the increased industrialization of the area. Surveying the various fuels in common use in the state of Washington it is reported

that coal consumption probably reached its peak during the war years and that in 1944 total consumption approximated 3,400,000 tons as compared to about 2 million tons in 1939 and 2,400,000 tons in the postwar year of 1948. A decline in the importance of coal as a fuel is expected with the possibility that higher grade out-of-state coal may become increasingly important.

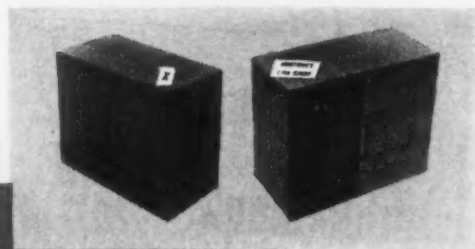
Use of gas has been limited in the Northwest area since only the manufactured type has been available at comparatively high cost although there is some hope that natural gas will be piped into this territory from Alberta, Canada. Oil consumption has increased in this area since 1939 both for industrial and domestic uses and rated by B.T.U. is today the most widely utilized fuel. Since this report was released considerable interest has been developed over an exploratory oil well being drilled near Hoquiam by the Union Oil Co. Up to late last week the well had been producing an average of only 14 barrels a day by pumping but interest in this prospect remains high.

Use of Wood Fuel Declines

According to this analysis more than 12 billion kwh of electricity were used in 1948, 70 pct of which was produced by public utilities.

Wood, which has long been an important source of fuel for both industry and domestic use in Washington, has consistently and gradually lost its standing. It is stated that this decline in the use of wood as a fuel is to continue.

An analysis of the industrial power requirements for iron and steel and their products revealed that in 1940 these industries needed approximately 34 million kwh and in 1945 demand had risen to approximately 129 million kwh. Reflecting the heavy demand of electric power by the aluminum industry, the non-ferrous metals and their products division in 1940 utilized 184 million kwh and by 1945 had reached a peacetime demand of approximately 4,229,000,000 kwh.



Upper photo: Armstrong's C-199 Cement does not shrink and tear loose from insulating fire brick surfaces.

Lower photo: This cement can be poured readily from the drum, even after as long as six months' storage.

One refractory cement for all your bricklaying jobs

You can use Armstrong's C-199 Cement with clay fire brick or insulating fire brick. This cement forms a joint stronger than the average fire brick it bonds. It takes a strong set at room temperature and maintains its strength throughout its entire working range. C-199 bonds to cooler portions of the wall as well as exposed brick work, assuring a uniformly strong bond throughout the furnace.

A new development used in formulation of Armstrong's C-199 eliminates the need for the usual bonding and plasticizing agents that cause shrinkage, cracking, or crumbling out of joints. When used with insulating fire brick, Armstrong's C-199 will not tear or shrink the brick surface.

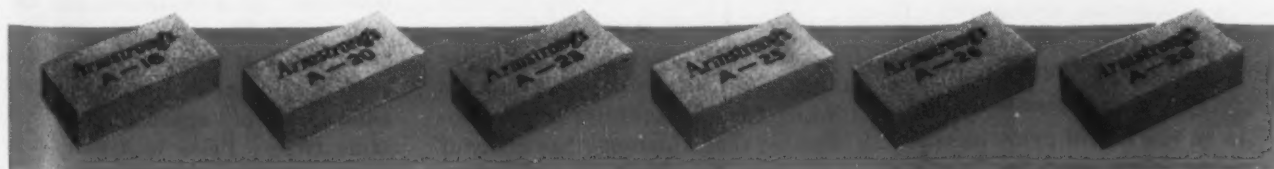
Armstrong's C-199 Cement will not soften and run out of joints and will withstand abrasion, slagging, and spalling. It meets ASTM, American Re-

fractories Institute, and U. S. Navy standards for a super-duty mortar at 2910° F.

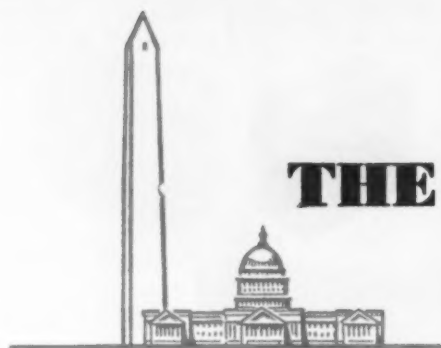
Because it can be used with both fire and insulating brick, you can buy C-199 Cement in economically large quantities, keeping inventories simple and warehouse stocks small.

C-199 is easy to handle on the job, too. It is thoroughly mixed at the factory to a smooth consistency and stays that way even after six months' storage. It remains in suspension in the mortar box when thinned with water to dip-joint or facing consistency and has good water retention, allowing it to be spread well ahead of the mason.

For full information on this all-purpose cement, write today for the free booklet, "Armstrong's C-199 Cement," Armstrong Cork Company, 4903 Mulberry St., Lancaster, Pa.



ARMSTRONG'S INSULATING REFRACTORIES



THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Senate-House group split on price-fixing controls for steel industry . . . British make strong entry in machine tool race . . . Army seeks research increase.



by

Eugene J. Hardy

Washington — The price rises put into effect by the nation's steel companies last December are about to provoke a Senate report that might be startlingly reminiscent of the steel-nationalization views of the British Labor Party.

The Senate - House Economic Committee, which is writing the report on its exhaustive investigation of the price increases, is split sharply over the views that seem slated for incorporation in the final draft of the report.

The members of the committee already have held several meetings on the subject, and have not agreed on any of the major points at issue.

First Draft Drew Objections

The first draft of the report, which embodies the views of Committee Chairman O'Mahoney, D., Wyo., and other Democratic members, brought strenuous objections from Republican members.

As to the actual price increases, this first draft concluded that they were "entirely unwarranted" and may set off a substantial downward trend in the entire economy.

But the suggested remedies are what caused the fur to fly. These include: A moratorium period between announcement of steel price increases and their effective date; a study to determine whether steel is actually a public utility; and a continuing study of the financial structure of the steel industry.

Consider Steel Controls

The suggested moratorium would call for a 30-day period between the announcement of a price rise and its effective date. During this period, the Joint Economic Committee or the Federal Trade Commission would hold hearings on the merits of the price increases. There was no hint of government control, the theory being that public pressure, brought about as a result of the hearings, might hold off so-called "unwarranted" price boosts.

Sen. O'Mahoney would also like the JEC to examine the extent to which the steel industry has demonstrated that it actually has many of the characteristics of a public utility. The feeling is that steel is of such great importance to the economy as a whole that its actions are

in the public interest. There was a strong hint in this first draft that the steel industry should be treated like the light companies, gas companies, transportation companies and phone companies and be answerable for its action to some sort of utility commission.

This report would also require the FTC to make a continuing study of cost, price and profit relationship of each major steel product.

On the New England situation, it was held that present steel industry policies are "a deterrent to new enterprise."

Government Paying Bill

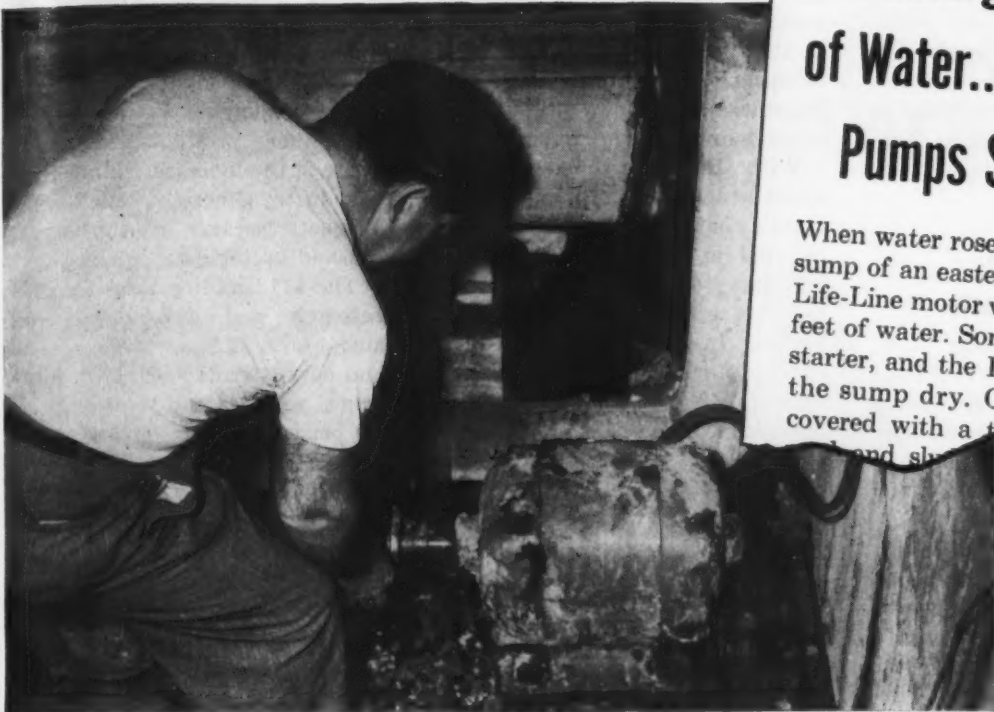
The burden of added cost for the post-war expansion of steel facilities and capacity is being borne by "the government and consumers." This reasoning is another crack at price increases. The draft copy notes that all prices were announced at approximately the same time. Price leadership was the target here.

In conclusion, it was noted that there are "definite indications" that the independent mills and non-

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Westinghouse

Submerged in 6 ft.
of Water.. Open Motor
Pumps Sump Dry

When water rose accidentally in a sump of an eastern plant, an open Life-Line motor was covered by six feet of water. Someone pressed the starter, and the Life-Line pumped the sump dry. Outside of being covered with a thick coating of sand and sludge



Can your *PUMPS* use this Life-Line motor stamina?

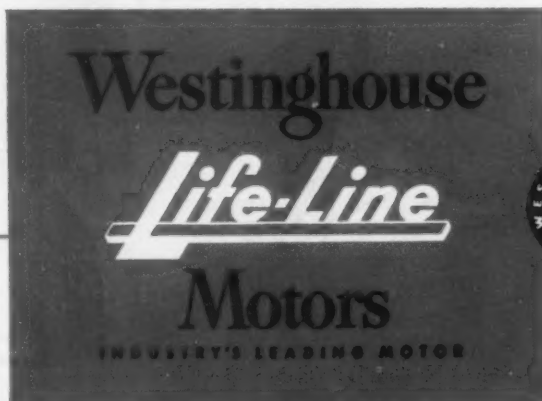
We certainly do not recommend open motors be operated under these conditions—in fact, we say **DON'T DO IT!** But this actual example illustrates the real stamina built into Life-Line motors—stamina resulting from improved materials and manufacturing methods.

Take the stator, for example. Coils are wound of Tufvar wire—wire you can pound with a sledge, tie into knots, without disturbing the insulation. Pear-shaped slots enable coils to be slipped into place without forcing. A fiber wedge closes top of slot, seals against dirt and moisture. Multiple dips and bakes in Thermo-set varnish give the stator a tough flexible film, resistant to oil, moisture, acid and alkali. That's

why, in the above example, there was no winding short-out—even under water.

It costs no more to get this extra motor stamina. Simply specify Life-Line as the drive for your equipment. Ask your local Westinghouse representative for details and a copy of booklet B-3842, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.
J-21573

— If you figure LIFE-COSTS... you'll figure LIFE-LINE —



integrated producers are being squeezed by actions of the major producers.

Significant fact is that these views are credited to Theodore J. Kreps, committee staff director. Mr. Kreps was economic adviser to the old Temporary National Economic Committee, also headed by Sen. O'Mahoney.

U.S. Industry in Line For Atlantic Pact Aid Contracts

With shipments of excess U. S. military equipment to North Atlantic Pact countries already underway, the big question is what portion of the total \$1.3 billion aid program will wind up as contracts for American industry.

The Army will be the primary procurement agency for the program and expects to have about \$800 million available for this purpose. About \$243 million of this is expected to be new procurement directly for the recipient countries, according to Gen. J. Lawton Collins, Army Chief of Staff.

The remainder will be used by

the Army as reimbursement for material taken from its stocks and also for rehabilitating, repairing, packing and crating. A large part of this \$800 million, however, will be spent by the Army to replenish its stocks with new, and in some cases, more modern equipment.

With the Army expecting to spend about \$800 million, it would appear that some \$200 million will be used to furnish raw materials, machinery and technical assistance to increase arms output in Western Europe. In any case, the total spent for this purpose, utilizing ECA procurement procedures, will not be less than \$100 million.

Army Asks for Increase In Budget for Metals Research

Army appropriations requests for research and development purposes for the fiscal year 1951 are \$6 million higher than the estimated \$106 million to be spent for this purpose during the fiscal year which ends June 30. The increase, if granted by Congress, will be used to place increased emphasis on

three projects of interest to the metals industry. These are: Improved surface-to-surface guided missiles; anti-aircraft missiles and guns; and, improved tanks, their weapons and ammunition, for the defeat of armor.

Another project which would share in the increase, of importance to industry generally, calls for more adequate research in security methods and protection.

The \$112 million total for direct research and development costs amounts to 22.3 pct of the research and development budget for all the armed services and represents only 2.8 pct of the Army's total budget. The latter figure may be compared with 5 pct usually allocated to research and development by forward-looking industry, says Maj. Gen. W. O. Reeder, Deputy Director of the Army's Logistics Division.

Competition for U. S. Products In British Machine Tool Industry

The domestic machine tool industry appears to be headed for tougher competition from England.

Marshall Plan officials recently reported that the United Kingdom will ship about \$121 million worth of machinery and equipment to North America in 1949 and 1950.

This volume will climb to about \$164 million during 1951 and 1952, the officials say. They believe this increase will be due to (a) pound devaluation and (b) an increasing Canadian demand for the British product.

As an adjunct to this latter theory, the British tool builders are planning extensive and elaborate displays at the Third Canadian International Trade Fair, which is to be held in Canada next June.

British trade also looks forward to an increase in machinery exports to the United States. No estimate of the rate of increase is given by the Marshall Plan people, but they do anticipate that it will be "substantial."

Machinery and equipment accounted for about 20 pct of British exports to the dollar area during the first 2 years of Marshall Plan activity.

THE BULL OF THE WOODS

By J. R. Williams



How To Choose Wire Drawing Lubricants

FIG. 1—Coiled rods for ordinary carbon steel wire receive their initial reduction with dry die lubricants, such as the soap powder shown here. Courtesy Jones & Laughlin Steel Corp.



By E. L. H. BASTIAN
Staff Engineer,
Shell Oil Co., New York

Lubricants play a vital part in drawing all metals. Lubricant recommendations for rod, intermediate wire and fine wire drawing in wet and dry systems show the vast variety of materials used and where they are applied.

LUBRICANTS are used in drawing practically all ferrous and nonferrous wire. Methods of operation, drawing speeds, types of wire, size, drafting practice, and design and types of dies all bear on the lubricant selection. In general, however, as in other kinds of metal drawing lubricants, wire drawing solutions and compounds serve basic purposes. The principal purposes are to lubricate and cool the work and the die, and to prevent welding or other metallic adhesion of wire to the die surfaces. Because of the reductions taken and the speed of drawing, unit stresses are high, resulting in pressure con-

ditions between die and wire necessitating boundary lubrication.

As contrasted to ordinary *thick film* or *hydrodynamic* lubrication, boundary lubrication is characterized by relatively higher friction values, high unit pressures, and actual metal to metal contact between adjacent sliding surfaces. To whatever extent friction between the die and the wire can be reduced, in just that proportion will the availability of power supplied to the machine be increased to perform the desired work of deforming and reducing the wire diameter through the die. This action facilitates

drawing, aids in preventing frictional heat buildup in dies, and prolongs service life of dies.

Cooling action may be of two types: Either to prevent frictional heat by lubrication or chemical action at the metal surface or to physically carry off heat generated by die friction and deformation of the metal. The latter is most generally implied. Temperature control at some equilibrium operating level is desirable and attained by heat exchangers in wet wire systems and water cooled dies in dry wire systems.

The third purpose of a wire drawing lubricant, to prevent welding or galling of the wire to the die, is perhaps the most important since any buildup by welding affects wire subsequently passing through the die and affects the die itself. The function of lubrication to improve production and prolong die life can be accomplished only if the lubricant contains substances to prevent such welding. Under conditions of high pressure and speed, either chemically active constituents or polar compounds are used in wire drawing lubricants.

Wire drawing lubricant types are based largely upon the prevailing methods of operation and the facilities for handling. The selection for any installation must be guided by the wire drawing methods used and the lubricating system provided. Types of wire drawing lubricants are: (1) Dry soap powders, usually sodium soap; (2) Fatty oils, such as tallow; (3) Greases, usually lime base; (4) Soap-Fat past compounds of various composition and proportions used either neat or as emulsions; (5) Soap-Oil lubricants; (6) Sulphonated oils and triethanolamine soap lubricants; (7) Soluble compound mineral oils; (8) Straight mineral oils; (9) Mineral-Fatty oils; (10) Chemically active compounded oils; (11) Soft metal coatings such as copper, tin, zinc and lead; and (12) Dry non-metallics such as lime and graphite. These general types are specifically discussed in connection with particular methods of drawing and processes.

WET AND DRY DRAWING

Dry drawing is used principally in drawing ferrous wire and for large diameter wire drawn at relatively low speeds. Dry drawing may be used either in connection with single hole block drawing machines or in multi-die continuous drawing frames, wherein the wire is given a number of successive reductions in the same frame before annealing or finishing.

In wet drawing, used both in drawing ferrous and nonferrous wire, the wire is drawn in continuous type, multi-die machines in which a fluid, usually an aqueous solution or emulsion, is circulated over the dies, wire, and sheaves or blocks.

Where finish is important in ferrous wire, wet

drawing is used. Although more expensive than dry drawing, more durable, cleaner, brighter finishes are obtained. The wet system is used almost entirely in nonferrous wire drawing, especially in copper, brass and aluminum wire. Some aluminum wire is drawn in coarse sizes in continuous dry drawing machines, employing either oil or grease type lubricants.

Because wet wire systems inherently provide

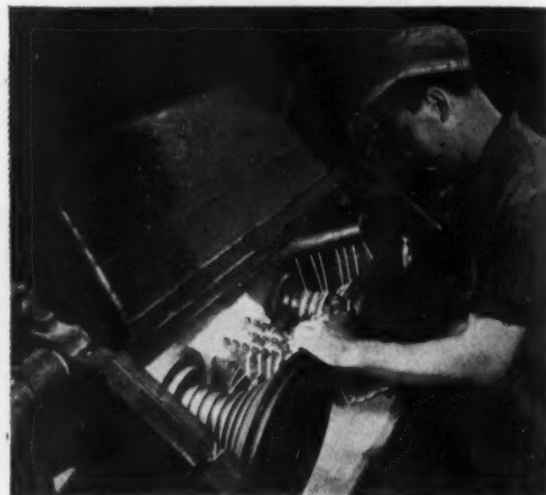


FIG. 2—In drawing to finer carbon steel wires, wet wire systems are used. Courtesy Vaughn Machinery Co.

for cooling dies and wire by circulatory use of a coolant or lubricant, they can be operated at considerably higher speeds than dry drawing systems. Although the latter often have internally cooled die blocks, they are practically never used for fine sizes. The exception to this is in cases of drawing special wire at high temperatures, such as tungsten wire where graphite is used as a lubricant.

There are three groups of wire sizes of interest, since conditions in all three vary one from the other, particularly with respect to drawing speed. These sizes are referred to as (1) rod or large wire; (2) intermediate or coarse wire; and (3) fine wire.

Starting with No. 5 rod size, carbon steel wire is dry drawn in large and coarse sizes, usually employing a fine grade of sodium soap powder as the lubricant in the box ahead of the die. Very dry sodium soap is effective between steel surfaces at high pressures and moderate rubbing speeds. Friction and power requirements for drawing are reduced as compared to drawing with the soap lubricant. Dry soap and other lubricants used in dry drawing, however, do not ordinarily produce the good finishes characterized by wet wire drawing at higher speeds.

Within the limits of its usefulness, this does not mean that soap is a poor lubricant. It is a good lubricant since it does not appear to permit any extreme burnishing action by the die and the wire. Dry soap is often difficult to clean from

the wire; it may cause some annealing problems; and is not suitable for high speed drawing unless extremely good cooling of the dies can be effected.

The use of *sull* coating, hydrated iron oxide, immediately following the initial acid pickle of steel wire coils is common. Following this, the wire may also be given an immersion in a 140°F slaked lime emulsion to apply an adherent lime coating that protects the metal surface during drawing and acts as an absorbent coat or sponge for the lubricant subsequently used in wet drawing.

The dipped lime coat is baked onto the wire in special baking ovens for several hours at 300° to 400°F. This baking not only produces a dry, hard coating of lime on the *sull* undercoat, but drives off hydrogen absorbed by the steel in pickling. If not removed, this hydrogen causes acid brittleness or hydrogen embrittlement.

By the use of baked-on lime coatings and dry soap drawing lubricants, bright finishes are produced. The thinner the lime coat, generally, the brighter the wire. Sulling is not used in this case, as the iron oxide tends to discolor the wire and produce a darker finish upon drawing.

In wet drawing carbon steel wire, the wire may be lime, copper or tin coated before drawing. Copper and copper-tin coatings are produced by immersion of the bare pickled wire coils in copper or copper-tin sulphate salt baths. This leaves a thin soft metal coating on the wire that assists in drawing in either *liquor* or compound solution systems. Liquor solutions are fermented solutions made from yeast and rye meal. From these several processes and developments are derived the commonly used nomenclature for *coppered* and *liquor-finished* steel wire.

Most steel wet wire drawing is done with soap-fat emulsions of modern types. Most commonly used compounds are paste consistency products containing about equal parts of sodium or sodium-potassium soap, free fat, and water. Several

fatty oils are used in such compounds, principally tallow, degreas and hydrogenated oils. Free fatty acids may, in steel wire drawing compounds, range from 2.5 to 3 pct.

Emulsions or solutions made up from the compound may contain from 0.75 to 3.0 pct of soap-fat solids by the Babcock test. This range depends upon the type of wire, that is, high or low carbon, alloy, etc.; the nature of precoating; the wire size; drawing speed; and type of machine. Wet wire solutions are held at 130° to 140°F bulk temperature in the circulating system, which may supply one or an entire battery of drawing machines. This compound, having a pH in the emulsion form of about 8 to 9, is commonly used for bright wire, coppered wire and zinc-coated wire. To improve lubrication, the fatty oil content may be as high as 45 to 50 pct.

Where lime coated wire is drawn, the lime combines with the free fat and fatty acid in the solution, causing *soaping-out* action or the precipitation of insoluble soaps. These attach themselves to the interior surfaces of the circulating systems, causing constrictions in flow or even clogging up of the piping.

To avoid this condition, relatively low fat, high soap compounds in as lean an emulsion concentration as wire finish and die life will allow can be used. Carbide and diamond finishing dies in wet systems allow some latitude. The soap content must be not too high or foaming in the large system may result. Special soaps in concentrations up to 40 pct in the neat compound are typical for one such product. Free fat is extremely low and the compound is alkaline. The pH in a typical 1.5 to 2 pct emulsion is about 10 or 10.5. While ideal for drawing limed steel wire, such a compound cannot be used on zinc or aluminum coated wire because the high alkalinity pH causes serious white stains, ruining finish and appearance. Such stains are caused by salts formed on the metal surface by the water.

HIGH CARBON STEEL

High carbon steel wire, 0.40 to 1.20 pct C, used in wire rope, springs, needles, pins, wire brushes, etc., is both dry drawn and finish wet drawn, the same as low carbon steel wire. High carbon wire, susceptible to heat treatment, is especially treated by *Patenting* to insure adequate drawability. Patenting, instead of ordinary annealing, is done to obtain a fine pearlitic structure. Essentially, the wire is heated above the transformation range and quench cooled in molten lead held at a temperature suitable to the carbon content of the steel.

In drawing special wire such as most high carbon fine wire, tool steel wire, or very high carbon-high chromium compositions, the operation may be performed hot instead of cold. Wire passes continuously through a molten lead bath held at about 1000°F, and goes directly to the



FIG. 3—Single-draft draw block die assembly showing lubricant box through which stainless wire is passed before entering the die. Courtesy Carpenter Steel Co.

die block just ahead of which a graphite lubricant is applied. The vehicle carrying the graphite flashes off since the wire and dies are about 600° to 650°F. The graphite left behind is the lubricant. This technique is also employed in some high tensile nonferrous metals.

STAINLESS

Drawing stainless steel wire of heavy gage, such as for refrigerator shelves, and fine sizes for aircraft and recorder wire, is important in modern wire mills. The inherent tendency of some stainless types to work harden poses special problems. Finish requirements for most stainless wire necessitates somewhat special drafting practices and lubricants. Carbide and diamond finishing dies are usually employed, and drawing speeds are somewhat lower than those used in drawing carbon and low alloy steel wire. Both dry and wet wire systems are used, dependent upon the reductions and wire sizes to be drawn. Two broad types of drawing lubricants are commercially used: (1) Heavy drawing oils and chemical compounds in single hole and continuous dry machines; and (2) light viscosity compounded oils and special aqueous emulsions in circulating systems for wet drawing.

The oil type lubricants contain soaps and/or

chemically active E.P. constituents, such as chlorinated compounds. In some cases, heavily compounded metal cutting oils containing active chemicals, fats and high free-fatty acids are



FIG. 4—Rod reduction stands for dry drawing of stainless steel wire at the Rustless plant of Armco Steel Corp.

used at low drawing speeds. The viscosity of oils used in the lubricant box ahead of the dies in dry drawing continuous machines may range from S.S.U. 700 at 100°F to as heavy as semi-plastic consistencies at room temperature, about

Wire Drawing Lubricants

Metal Drawn	Method of Application	Type of Lubricant	Total Solids Concentration in Water, Pct	Average Water Dilution, Parts Water per Part Lubricant	Operating Comments
FERROUS					
Carbon and Low Alloy Steel.....	Dry Draw	1	—	No Dilution	Used neat in die box
		2	5	20	Sprayed on hot wire
Carbon and Low Alloy Steel.....	Wet Wire	3	1 to 3	25	Solution at 130° to 140°F
		3a	1 to 3	25	Solution at 130° to 140°F
Stainless Steel.....	Dry Draw	4	—	No Dilution	Hot dip precoating
Stainless Steel.....	Wet Wire	3	3 to 4	20	Solution at 140°F
		5	—	No Dilution	Oil and 160°F
NONFERROUS					
Heavy Copper Wire and Rod.....	Dry Draw	1	—	No Dilution	Used neat in die box
		6	—	No Dilution	Used neat in die box
Heavy Copper and Brass Wire.....	Wet Wire	7	4 to 6	12	Solution at 150°F
Fine Copper and Brass Wire.....	Wet Wire	8a	1 to 2	30	Solution at 110° to 130°F
		8b	1 to 2	30	Solution at 110° to 130°F
Heavy Aluminum Wire and Rod.....	Dry Draw	1	—	No Dilution	Used neat in die box
		6	—	No Dilution	Used neat in die box
Heavy and Medium Aluminum Wire.....	Wet Wire	9	—	No Dilution	Oil at 150° to 170°F
Intermediate Aluminum Wire.....	Wet Wire	10	—	No Dilution	Oil at 130° to 150°F
Fine Aluminum Wire.....	Wet Wire	3	3	20	Solution at 110° to 130°F
		11	—	No Dilution	Oil at 130° to 150°F
Tin and Lead.....	Wet Wire	11	—	No Dilution	Also used in die box
Zinc Wire.....	Wet Wire	7	3	20	Solution at 130°F
Gold, Silver and Platinum.....	Wet Wire	7	3	20	Solution at 130°F
Tungsten, Etc.....	Dry Draw	2	5	20	Sprayed on hot wire

TYPES OF WIRE DRAWING LUBRICANTS

- 1—Dry sodium soap powder
- 2—Dry flake or amorphous graphite, applied in volatile vehicle
- 3—Steel wet wire drawing compound; Soap-Fat paste type, low soap, high fat and free-fatty acid group
- 3a—Steel wet wire drawing compound; High soap, low fat and free fatty acid group
- 4—Lead or other soft metal coating
- 5—Chemically compounded mineral and mineral-fatty oils
- 6—Copper wire and rod drawing grease; Calcium base grease of medium soft (NLGI No. 1 or 2) consistency

- 7—Copper wire and rod drawing compound; Low soap, high fat, but low free fatty acid group
- 8a—Fine copper wire drawing compound; Soap-fat paste type
- 8b—Fine copper wire drawing compound; Soap-oil type (liquid)
- 9—Heavy compounded aluminum wire drawing oil; Viscosity S.S.U. 2000 to 3000 at 100°F
- 10—Medium compounded aluminum wire drawing oil; Viscosity S.S.U. 300 to 700 at 100°F
- 11—Light compounded aluminum wire drawing oil; Viscosity S.S.U. 100 to 200 at 100°F

S.S.U. 400 to 700 or higher at around 210°F.

Oils of lighter viscosity, S.S.U. 200 to 1500 at 100°F, can be used in circulating systems on wet wire machines, depending upon pumping facilities and the bulk temperature of the lubricant. A reasonable bulk temperature is about 150° to 160°F, controllable by heat exchangers.

Oils do not furnish the physical cooling that aqueous solutions provide in circulating systems. Such aqueous solutions may be used in wet wire systems, dependent upon production, die life and drawing speeds considered acceptable.

COPPER AND BRASS

Copper and brass wire is almost always drawn to finished size by the wet wire method. Heavy gages of brass may sometimes be dry drawn, using powdered soap. Wet wire lubricants and compounds used for copper and brass are usually of the water miscible type. Neat, before mixing with water, these may be either liquid or pastes containing soaps, fats, fatty acids, oils, amines, alcohols, water, and other constituents. Composition and dilution of the compound will depend upon whether they are intended for rod breakdown, intermediate, or fine wire drawing.

In copper rod breakdown, from $\frac{3}{8}$ in. rod to about No. 14 B&S Gage wire, the starting size is passed through a lubricant box ahead of the first die in the machine. This box contains tallow or some similar fatty compound that is usually heated by a gas burner to insure fluidity to coat the heavy wire and be drawn into the starting die. Immediately following, the wire is wet drawn by continuous drafting.

Compounds used in the wet wire solution are usually a combination of potassium soaps, tallow and water. Other types of fatty oils and fats such as degreas, tall, rapeseed oil, olive oil and hydrogenated fats may be used instead of tallow. However, the composition of compounds used in drawing copper and copper alloy wire should be relatively low in free fatty acid to avoid the excessive formation of detrimental green copper soaps. These soaps, green scum, are considered to be abrasive to dies. The free fatty acid of the neat paste or liquid compound, before water dilution, should not exceed about 0.75 pct.

Soap contents of the compound may vary from 6 to 20 pct, depending upon the proposed speed of drawing, the extent of agitation of the solution, and the concentration of soap-fat solids in the solution. The soap content should be an inverse function of these factors; that is, the greater the drawing speed, solution agitation and concentration, the lower should be the soap content of the neat compound. This avoids foaming. Soap-fat solution concentration in rod breakdown wet systems is about 4 to 6 pct, and the solution temperature is maintained at about 150°F. By the periodic addition of sodium hydroxide in small

Soap-fat paste compounds, sometimes incorporating special waxes and chemically active constituents, have shown promise in this connection. Oil type lubricants appear to be better than aqueous solutions or emulsions. Where other lubricants fail, soft metallic coatings can be tried. Coatings such as lead, which are adherent and have low friction and good protective characteristics, have long been used, but the obvious disadvantages are the time consuming and consequent costly methods required for application and removal.

amounts, the pH of the solution is held between 8.5 and 9.5 for ordinary operations. Drawing speeds for rod and heavy wire are about 2000 fpm, but speeds may exceed 5000 fpm.

For intermediate copper and copper alloy wire, down to about No. 28 or 30 gage, the same type of drawing compound is used, but the conditions of application are different. Soap-fat solids concentrations of 2 to 3 pct and solution temperatures of 120° to 130°F avoid foaming. Since higher drawing speeds of 4000 to 5000 fpm prevail, relatively low soap content compounds, 6 to 12 pct soap, minimize the foaming problem. The compound may be either a paste or liquid emulsion.

For fine copper wire, concentrations of 1 to 2 pct of the oil type fluid are used in water for the wet system. Because of special formulations and proportions of soap to fatty oils, there is little propensity toward foaming in high speed circulatory service even when concentration is increased to as high as 3 or 4 pct. This is definitely advantageous over older type soap or soap-fat compound solutions, which had to be held to low concentrations, often less than 0.5 pct, to prevent foaming. Conversely, too high a fat content in a fine wire drawing solution may cause sticky wire, wrapping, and wire breakage. Bulk temperature of solutions in fine wire drawing is about 90° to 110°F.

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FIG. 5—Drawing oil is applied to stainless wire before it enters the die of this multiple-draft draw block die assembly. Courtesy Carpenter Steel Co.

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Novel Repair

Saves High Replacement Cost

SAVINGS in time, material and equipment were made by the Kaiser Steel Fontana plant by the use of a new technique for repairing a broken mill spindle.

After five years of service, a spindle, shown in Fig. 1, on the 36-in. blooming mill fractured. The break occurred in one jaw of the spade coupling, completely severing the jaw. The motor which powered the mill was rated at 5000 hp.

Although this was the first 36-in. mill spindle to fracture, a 29-in. structural mill spindle had, in the past, required similar repairs. It was decided at that time that due to the high cost of the spindle and the distance from the manufacturer, it would be more economical to repair rather than scrap and replace the spindles.

Although the original spindle was a 1045 forged steel, it was felt that a coupling cast of chrome molybdenum steel would give longer life. The pattern for the coupling was made at the Kaiser pattern shop and a new casting ordered.

The coupling of the 29-in. mill spindle had been burned off by hand, and while that method had

proved essentially satisfactory, it was decided to attempt to remove the head of this spindle by using stationary, high-powered blow pipes and, with a positioner, slowly rotate the spindle on a roller bed.

The spindle was first placed on the roller bed and connected to the Ransom positioner. This positioner had been equipped with a double universal joint between the positioner and the work to eliminate the necessity of centering the spindle, as shown in Fig. 2. Another feature of the positioner was an auxiliary conduit, or jumper, which by-passed the double universal joint, thus avoiding the heat resistance built up in the joint and insuring an even rate of rotation for welding.

After the spindle had been positioned, using two sets of rollers as a base, an enclosure was built to act as a furnace for preheating. This furnace was constructed of open hearth furnace brick with an asbestos paper roof to insure complete enclosure.

Two blow torches, burning natural gas, supplied the heat. Only draft slots and burner ports

FIG. 1—Fractured 36-in. mill spindle before repairs were begun. Sketch shows location of the two cuts made during the repair operation.



Kaiser repairs broken mill spindle
by burning off the fractured end and machining it
to fit a new jaw and then shrinks
the cast steel jaw on to the original forging.



FIG. 2 — The positioner, showing double universal joint and jumper conduit.

were left open. Build-up time for the furnace was approximately $1\frac{1}{2}$ hr, while $3\frac{1}{2}$ hr were required to heat the spindle to 1000°F . During preheating the spindle was rotated to insure even heating. Previously, spindles had been heated to about 500°F but it was felt that the time saved by eliminating the necessity for normalizing the spindle after cutting more than compensated for the time spent in building the furnace and raising the temperature to 1000°F .

When the desired temperature had been reached, the furnace was torn down and a sample cut 12 in. deep was taken. The sample proved highly satisfactory, showing a straight, smooth cut and no slag. The stationary burning torch, capable of burning approximately 18 in. of steel, was then set perpendicular to the axis of the shaft to cut the jaws of the coupling (see Fig. 1). Since additional oxygen pressure was necessary to burn through the heavy steel, it was found desirable to run an oxygen line direct to the manifold, which made available 80 psi.

The spindle itself was rotated at 6 ipm, while the torch remained stationary. The total time required to cut both jaws was 20 min., and the rapidity of the cutting can, in part, be attributed to the high preheat temperature. During the burning there was no appreciable drop in the temperature of the spindle, the heat of the torch compensating for natural cooling.

After both jaws were removed, the torch was set next to the shaft, parallel to the axis of the spindle, its burning tip toward the fractured coupling, as indicated in Fig. 3. The spindle's rate of rotation being constant, this operation required 30 min, the rough diameter of the shaft being 21 in. when the cutting was completed.

The spindle was then taken to the machine shop and roughed down from 21 in. to 16 in. on a 48-in. Niles-Bement-Pond engine lathe. The butt was then faced on the same lathe and key seating was done on an Ingersoll milling machine. After the new coupling had been key seated on a planer and shrunk on a shaft the job was complete, Fig. 4.

The use of this technique effects many economies in time, material and equipment used. The first saving apparent in the operation results from the elimination of the necessity for normalizing the spindle after cutting, since the metal was cut at a temperature of 1000°F and then insulated with asbestos paper to allow slow cooling.

A second saving resulted from the fact that the time required for burning was decreased by two-thirds. The only available comparison, the 29-in. mill spindle, was cut by hand. Due to the inability of a hand torch to trim the shaft to the desired diameter in one operation, it was necessary to make several shallow cuts and remove the



FIG. 3—Making the second cut with the torch parallel with axis of the spindle. The spindle is rotated, while the torch is stationary.

coupling gradually. It was further noticed that the stationary torch left a much smoother surface than the hand torch.

Another economy was the saving in time and machinery due to the ability of the stationary torch to cut the spindle to a smaller diameter, thus eliminating machining time. As previously stated, it was necessary to machine the spindle down from 21 to 16 in., while in the hand cutting operation it was necessary to start machining with a 24 in. diam.

This technique was found to be very satisfactory and the Forge and Weld Department anticipates applying it to any future jobs of this nature. It was suggested, however, that if a heavier, water-cooled torch were used, it could be set closer to the shaft of the spindle on the second cut and thereby reduce the shaft to a smaller diameter and eliminate even more machining.



FIG. 4 — The new spade coupling, showing one of the keys installed to insure against slippage.

New Books

"Tables of the Confluent Hypergeometric Function $F(n/2; x)$ and Related Functions." Prepared by the National Bureau of Standards, the tables have a wide range for x , providing a basis for more efficient use of analysis-of-variance tests than has heretofore been possible. The analysis of variance technique has found a number of important applications in industry for quality control. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 35¢. 73 p.

* * *

"Principles and Practice of Flow Meter Engineering," by L. K. Spink. New material has been added to this seventh edition, making the book a complete treatise on all phases of flow engineering. Information is contained on calculating an orifice, flow nozzle, Venturi tube, Pitot tube, or a pipe elbow used for flow measurement. Equations and curves for calculating throttle orifices to be used at critical pressure drops are one of the new additions. Foxboro Co. \$7.00. 416 p.

* * *

"Einführung in die Kristallographie" (Introduction in Crystallography), by H. Schneiderhohn. A complete history of crystallography, its geometric, chemical and physical aspects, is presented. The work covers all crystallized matter, and is written in plain style to act as an introduction to the subject. Verlag Karl Alber, Freiburg in Breisgau, Germany. 40 German marks. 464 p.

"Symposium on Metallography in Color." Leading authorities present the latest thoughts and practices, and discuss various techniques to record the characteristic colors seen visually. Equipment and photographic techniques are described, and the book contains 10 insert plates of 4-color process photomicrographs. American Society for Testing Materials, 1916 Race St., Philadelphia 3. \$4.50 with heavy paper cover, \$5.15 with cloth cover. 80 p.

* * *

"Earth Waves," by L. D. Leet. This second in the series of Harvard monographs in applied science summarizes present knowledge of earth waves. It discusses their application and use in prospecting for minerals, studying hurricanes, measuring vibrations from dynamite blasts to determine their effects on buildings, and mapping broad earth structures of geologic interest. Results of recent research on types of wave motion and microseisms are also presented. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. \$3.00.

* * *

"How to Plan Pensions," by C. W. Boyce. The book covers all phases of the pension problem that affect business and industry. Chapters on the planning problem are organized in 3 sections: Management review; negotiator's review; and reference review, including a check list and sample negotiated clauses. McGraw-Hill Book Co., 330 W. 42nd St., New York 18. \$4.50. 350 p.

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SURFACE FINISHING STAINLESS STEEL



By L. F. SPENCER

*Landers, Frary & Clark,
New Britain, Conn.*

Finishing practices for stainless steel have many variables. Major considerations and recommendations of equipment and methods as related to physical properties of these steels are presented. This first part of a two part article covers grinding. The second part to appear next week covers polishing and buffing.

THE realization of high mechanical properties such as hardness, tensile strength and ductility; excellent corrosion resistance; excellent service life in corrosion and heat resisting applications; and savings by the elimination of such operations as plating, heat treatment and pickling has led to a wide acceptance of stainless steel. To realize these benefits, however, a new approach must be made to methods of working these steels. In finishing stainless, methods must be adapted to account for the characteristics of these steels and precautionary measures must be established.

By finishing operations is meant grinding, polishing and buffing. Grinding refers to heavy cutting operations. Polishing is the smoothing of a metal surface by abrasive particles attached by adhesive to wheels or belts. Buffing is the smoothing of a metal surface by means of flexible wheels, to the surface of which fine abrasive particles are applied usually in the form of a plastic composition or paste.^{1,2}

Grinding and polishing methods can affect the physical properties of stainless steels. Due to the low conductivity of stainless, metal removal rates must be lower than with other metals. To overcome this slow metal removal, a common error is to increase wheel pressures. This is harmful because of the low thermal conductivity

and high frictional properties of these steels.

Increases in grinding pressures will cause overheating, consequent surface discoloration, and, in some instances, impair the corrosion resistance of the metal. With austenitic steels, work hardening of the surface will result. On thin gage austenitic distortion and severe warpage may occur.

The wheel should ride the work so that the cutting edges of the individual grits may do the work at the recommended speeds. Localized heating may result if the wheel is permitted to ride too long in specific areas, resulting in such defects as grinders' scorch, distortion and warpage. Continual movement of the wheel over the area to be ground is essential.

Martensitic and ferritic stainless compositions are sometimes difficult to finish because of their extreme galling and scoring tendencies. Wheels tend to load and produce objectionable scratches.

Grinding forged, forge and heat treated, and heat treated stainless parts may present other problems. Grinding should be deep and thorough to remove every trace of forging scale and decarburization. Remaining pits or oxides are potential seats of corrosion, and an electrolytic action may occur in service that will spread over the surface of the material. Finishing heat resisting steel is not usually done since the end

use of these steels will scale the part. Castings are frequently ground.

Grinding wheels used in finishing stainless should be used only for that purpose. Where wheels are indiscriminately used, the stainless steels are open to contamination from foreign materials.

Grinding can be done either on machine setups or with hand grinding equipment. The type and construction of equipment depends upon the operational procedure planned as related to such variables as size and shape of the work, surface finish desired, necessity for matching finishes, etc. Where difficulty is encountered with a specific stainless composition, wheel composition, wheel and work speeds, feeds, and other such variables should be examined. Generally, a preliminary investigation is economical to determine the proper methods in grinding stainless steels.

Heavy and well guarded 24 and 30 in. floor stands are used for production grinding of light and medium sized castings. These machines are equipped with two or more speed changes to compensate for wheel wear, which would reduce the peripheral speed of the wheel. Some machines have variable speed transmissions that provide the correct constant peripheral speed regardless of wheel wear.

Swing frame grinders are used to grind large castings and in rolling mills for bloom and billet preparation. Wheel diameters range from 16 to 24 in. and most machines have at least two speeds.

Portable grinders are used in snagging and removing defects on uninterrupted surfaces and inaccessible spots on complicated castings. The most effective portable machines are those delivering the most horsepower per lb weight. They

are operated by self-contained motors, and common sizes of straight wheels are 6 x 1 x $\frac{5}{8}$ in., and 8 x 1 x $\frac{5}{8}$ in. Thinner wheels of these diameters are sometimes used, and cone shaped wheels are available for grinding small radii, webs, or inner surfaces of hollow castings.

In finishing weld beads, finishes are usually matched with the finish of the base metal, requiring set procedures. The most common practice is to grind the welds, but where weld deposits are massive they may be removed with cutting tools. In initial grinds, a hard wheel is usually employed, either rubber or bakelite bonded and free cutting to avoid overloading. Roughing is with a hard wheel, aluminum oxide with about No. 20 to 24 grit size, as shown in Fig. 1.

For further dressing, an aluminum oxide wheel with the grit between No. 40 and 60 can be used. The number of further operations, using increasingly finer grit, will depend upon the desired finish. Where matching is desired, experience will dictate the steps, selection of grit size, and procedure. Localized heading should be prevented.

Where weld beads are to be ground and dressed to match mill finishes, hard wheel grinding should be stopped above the final finish level so that final treatment for matching will not produce a groove. Stops or limiting lugs attached to portable grinding machines on either side of the wheel will limit cutting depth. Adjacent surfaces may be protected by a coating of paper.

Machine grinding may replace machining where stock removal is not excessive because of the accuracy and smoothness of the ground surface and because the metal can be readily removed. Machine grinding precludes an operational procedure on a production basis, high dimensional accuracy, high finishes, etc.

Most cylindrical grinding is on heavy, rigid machines designed for precision work on a pro-

FIG. 1—Portable grinders are extensively used in finishing stainless castings and weldments. Here, weld beads on a stainless steel sink are being finished. Courtesy of Armco Steel Corp.





FIG. 2—This solid key shaft is ground on a 12 x 48-in. LCH universal grinder with a special dead spindle headstock with oscillating face plate. Courtesy Landis Tool Co.

duction basis. Grinding of the outside surface of the work is done with the work between centers or in a chucking arrangement. Cylindrical grinding includes limited form grinding such as tapers, cams, faces or shoulders, and some contours. Typical cylindrical grinding operations are shown in Fig. 2.

The use of steady rests is common in cylindrical grinding to overcome spring or vibration in the work. In long thin work, there should be rests about every 12 in.⁴ In other cases, a value equal to six to ten diameters of the work is used as a basis for placing steady rests. Grinding speeds are from 5000 to 6000 sfpm, varying with the structural condition of the metal. Wheel choice, and other factors will be based upon experience with specific problems.

The major elements in centerless grinding are a high speed grinding wheel, opposite which is

a relatively low speed regulating wheel, and between the two a work rest. In through-feed grinding, the work rests include a work support or blade, guides that lead the work to the wheels, and guides that receive it after grinding. A centerless grinding operation is shown in Fig. 3.

Pressures exerted by the grinding wheel force the work against both the regulating wheel and work support. The regulating wheel, usually a rubber bonded abrasive wheel, revolves in a direction that forces the work to revolve opposite to the direction of the grinding wheel. The grinding wheel operates at about 6500 sfpm and the regulating wheel can be operated from 12 to 300 sfpm, resulting in a surface cutting speed varying from 36 to 900 sfpm.

In centerless grinding stainless, factors such as blade material, angle and length; grinding wheel type, regulating wheel angle, and guide

TABLE I

WHEELS FOR GRINDING STAINLESS STEEL⁶

Operation	Type Wheel	Abrasive	Grain Size	Grade	Structure	Bond	Bonding Variation	Bonding Process
Free Machining Steels								
Centerless Grinding		37C	46	M	5	V		Vitrified
Cylindrical Grinding		37C	46	M	5	V		Vitrified
Surface Grinding	Cupped	32A	36	G	8	V	BE	Vitrified
	Cylindrical	32A	36	G	8	V	BE	Vitrified
	Segmented	32A	601	E+	12	V	BEP	Vitrified
	Straight	32A	46	H	8	V	BE	Vitrified
Cut-Off								
Dry, 12 to 16,000 sfpm		A	45	Q	8	B		Reinoid
Wet, 9 to 12,000 sfpm		A	45	V	8	R	30	Rubber
Tube Cut-Off								
Dry, 12 to 16,000 sfpm		A	80	V	10	R	29	Rubber
Wet, 9 to 12,000 sfpm		A	80	U	10	R	29	Rubber
Hardened Grades								
Centerless Grinding		57A	60	L	5	V	BE	Vitrified
Cylindrical Grinding		A	60	L	5	V	BE	Vitrified
Cut-Off								
Dry		A	46	M	8	B		Reinoid
Wet		A	60	P	0	R	30	Rubber
Hemming & Klotz Cutlery								
Roughing		A	60	L	7	B	4	Reinoid
Finishing		A	100	P	7	E	V	Shellac
Surfacing	Cupped	32A	24	G	8	V	BE	Vitrified
	Cylindrical	32A	24	G	8	V	BE	Vitrified
	Segmented	32A	301	E	12	V	BEP	Vitrified
	Straight	32A	46	H	8	V	BE	Vitrified
Internal		A	60	L	5	V	BE	Vitrified

adjustments are important. Low heat conductivity and work hardening of the specific grade of steel should be considered, and experimental work must be done to obtain proper grinding conditions.

Blade material is important since it has a direct bearing on surface finish. Cemented carbide, high speed steel, Meehanite, gray cast iron and aluminum bronze are used. A cemented carbide work blade, although expensive, is often economical because of reduced maintenance. In grinding difficult jobs such as thin walled austenitic tubing, cemented carbide blades may not be suitable because of the possibility of scratching or rings in the finished part. High speed blades are often advantageous where it is necessary to alter blades for work with multiple diameters or to obtain sufficient clearances.

The angular top work plate is applicable to most centerless grinding operations, the steepness of the angle being governed by the grinding wheel pressures permissible so as to eliminate chatter. It is usually advisable to reduce the top angle when the length of the blade or width of the wheel increases so that a decrease of side pressure on the blade is realized. This is also true when the diameter of the workpiece to be ground increases.

The blade is generally set so that the centerline of the work is higher than the centerline of the wheels. Where reduced grinding pressures are required, the position of the blade can be adjusted so that the work to be ground is higher than the recommended centers. The limit of adjustment is dependent upon the specific variables of the problem in mind, and experimentation alone will govern this adjustment.

A good starting point for choosing the type of grinding wheel is to start with a silicon carbide abrasive wheel, 50 grain, M3 grade, vitrified bonded. In working thin walled austenitic tubing, type 302, a number of wheels were tried. A C54-P3-RP rubber bonded grinding wheel had free cutting qualities, but was too soft and broke down. A C4A54-Q3-B3 resinoid bonded wheel was tried but lacked in free cutting properties and broke down rapidly. It glazed the work to such an extent that the parts were badly out of shape. A satisfactory grinding wheel for this specific job was unobtainable and it was necessary to use a wheel that approached the desired characteristics.

The position and speed of the regulating wheel is another factor that must be adjusted in accordance to the job. The angle at which the work wheel is may vary from a fraction of a degree in the case of austenitic thin walled stainless tubing to as high as 5° for hardened

parts that may have bad warpage. The speed may vary up to 115 sfpm. Because of the low heat conductivity of this material it is necessary to examine the work closely. The regulating wheel can be set in reference to the work support blade.⁴ The work should be as close to the grinding wheel and the blade as possible, allowing clearance between grinding wheel face and blade side when the work reaches its finished size. Guides are adjusted so that the work will slide

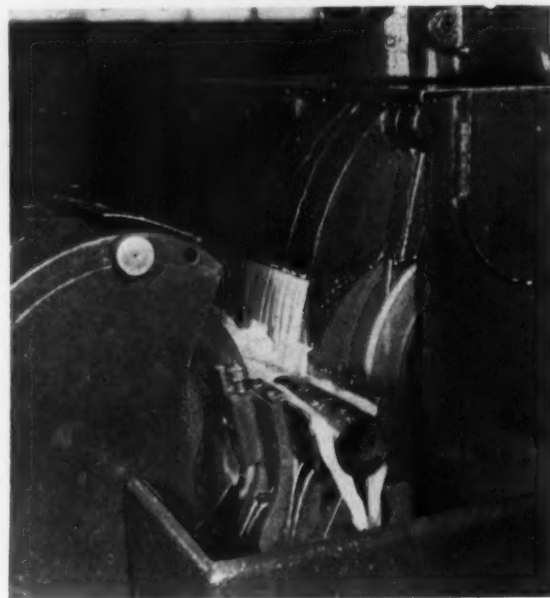


FIG. 3—Grinding thin walled stainless steel tubing by the through feed method in a No. 12 centerless grinder. Courtesy Landis Tool Co., Waynesboro, Pa.

through without interference from the wheel or the guide. To prevent spinning,⁴ the front guide bearing surface should be set behind the regulating wheel by an amount equal to 50 pct of the amount of stock to be removed during that pass, while the rear guide should be set back not more than 0.0005 to 0.001 in.

The total stock to be removed, its heat conductivity, and other physical properties, determine the necessity of roughing grindings prior to the final finishing pass. Optimum stock removal per pass can be set so that no ill effects may arise to detract from the desired surface finish. Experimental work is necessary to determine conditions that will yield the desired surface finish.

Extensive experimentation determined the conditions that would remove excess stock from thin walled stainless tubing, type 302, 2½ in OD by 5/32 in. wall thickness, and still have the finished parts within 0.0005 in., for straight and round, and 0.005 in. on size. To eliminate pickup, the work blade was set off center at a point where

chatter was first encountered. At this point pick-up was not entirely eliminated, but the surface condition had improved. The regulating wheel angle was adjusted in conjunction with a set speed and rate of feed of the regulating wheel. The best results were obtained with an angle of $\frac{3}{4}^\circ$ and regulating wheel speed of 30 to 35 rpm. Production was fair and the surface finish was satisfactory. Wheel life was far from satisfactory, since the soft wheel required frequent dressing. In finish grinding, the blade angle was doubled with approximately the same speed of the regulating wheel. Satisfactory work was obtained with aluminum bronze work blades.

The conclusions indicated that it was necessary to rough grind at a slow speed, with heavy cuts, with the work blade set as high as possible to reduce the down pressure on the blade. In finishing, both the rate of feed and speed could be increased slightly, but at no time should a cut greater than 0.0015 in. be taken. An aluminum bronze-tipped work blade was the most applicable since it practically eliminated scratches caused by pickup on the table. A disadvantage of this material is that it wears rapidly and it must be reconditioned every 8 hr. A Meehanite blade material may possibly be satisfactory where heavy walled austenitic stainless tubing is encountered. A filtered coolant is an advantage

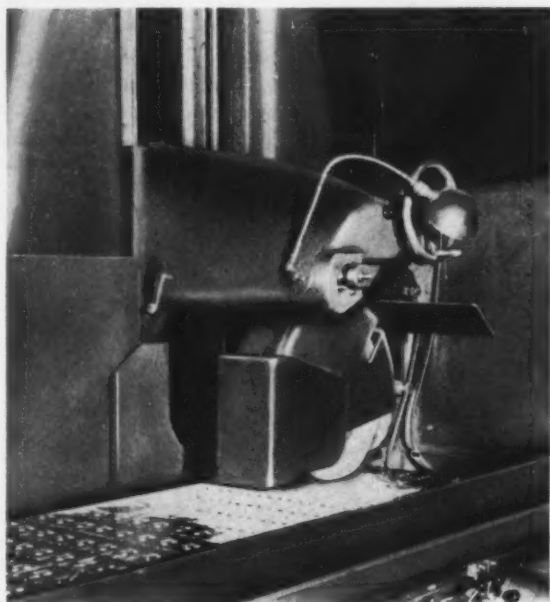


FIG. 4—Surface grinding safety deposit box doors made from 0.500-in. stainless steel. Courtesy Mattison Machine Works.

since grit that might mar the surface is removed.

Surface grinders are essentially wheel spindles mounting a grinding wheel and a working surface such as a table or chuck that brings the work in contact with the machine as shown in Fig. 4. These machines can be broadly classified as ver-

tical spindle, horizontal spindle or disk machines, with rotary or reciprocating tables. In most instances, the working surface travels.

The horizontal spindle, reciprocating table machine, using the periphery of a straight wheel, is used where accuracy and smoothness of surface are vital. Normally a tolerance of 0.0002 in. or less for straightness and dimensions can be expected. The surface attained consists of fine straight lines. The horizontal spindle, rotary table machines, using the periphery of a straight wheel, produce a surface consisting of concentric curved lines. The vertical spindle, reciprocating table machines using cup, cylinder or segments have a surface consisting of overlapping curves, usually referred to as a *Dutch Finish*. The removal of stock is more rapid than in the two preceding machines mentioned, but accuracy is not as great. Usually a tolerance of 0.005 in. or more must be permitted.

Where magnetic materials, such as ferritic and the martensitic stainless are ground, magnetic chucks can be employed. In grinding austenitic stainless, fixtures are used. Non-magnetic compositions require slower speeds and deeper cuts than martensitic or ferritic alloys. An ample supply of lubricant is necessary to prevent overheating. Overheating may seriously distort the items in austenitic steels, and a serious loss of corrosion resistance may result. Wheel recommendations vary with the specific job. The silicon carbide abrasive, 30 grain, S5 grade, vitrified bonded wheel, or the aluminum oxide abrasive, 36 grain, S4 grade, silicate vitrified or resinoid wheel can be used as a base point.

A few grinding tricks may be utilized in surface grinding. In grinding a large number of thin small pieces such as washers, considerable time may be consumed in loading a magnetic chuck. Loading time can be reduced by using flat boards about the size of the chuck, coated with the emulsifying oil used in the grinding fluid. A supply of washers placed upon the board stick sufficiently to permit the board to be turned upside down. When the chuck is cleared, the board loaded with pieces is laid on the chuck with loaded side down. When the current is switched on, the pieces will adhere to the chuck and the board can be slipped off.

Measuring parts to be ground can also be time consuming. This can be eliminated by using a copper plated sized piece as a spotter. Grinding can proceed to the point where the sized piece is touched; at this point the desired dimension has been reached. Another method is to place a diamond at the end of a chuck, adjusted to the proper height above the chuck, and arranged so that the diamond will pass under the wheel at each cycle of the table. At that point where the diamond starts to dress the wheel, the pieces ground will be to size.

Power Brushing Speeds Bumper Production

BY means of finishing techniques involving the use of power brushes supplied by the Osborn Mfg. Co. of Cleveland, the Auto-Lite plant at Sharonville, Ohio has been able to ma-



A power driven brush, rotating at 2100 rpm, cleans the top edge of an automobile bumper.

terially reduce rejects and lower production costs.

The brushes prepare a smooth surface on the bumpers prior to plating, blending all grit marks on the cold-rolled steel to permit a smooth chromium plate surface. The type of equipment used varies with the bumper section to be polished. A rotary machine is used for the top edge, an in-line machine for the bumper face, and end ma-

chines for the curved ends of the bumper. The heads on these machines rotate at 2100 rpm.

The flat steel sheets are prepolished when required, and are then cleaned to remove oils and abrasive grains. At this point the steel goes to the presses for blanking and forming. Following the forming, the bumpers proceed to the polishing department. The first operation there is the polishing of the bumper edge.

This is done on a nine-head rotary. The first three stations are No. 150 grit setup wheels run dry. The next five are No. 280 grit setup wheels run greased. Last is an Osborn Fascut power driven brush run with No. 80 grit emery.

The next operation is polishing the bumper face. This is done with a 12-head in-line machine. The first five stations are No. 150 grit setup wheels run dry, the next five are No. 220 grit setup wheels run greased, and the last two are Osborn Fascut brushes run with emery cake.

The remaining operation, polishing the bumper's curved ends, is done on eight tandem machines. The bumpers are carried through eight stations of two heads each. The first two stations are No. 150 grit setup wheels run dry, followed by four stations of No. 220 grit setup wheels run greased. Finally, two stations of Fascut brushes run with No. 180 emery cake.

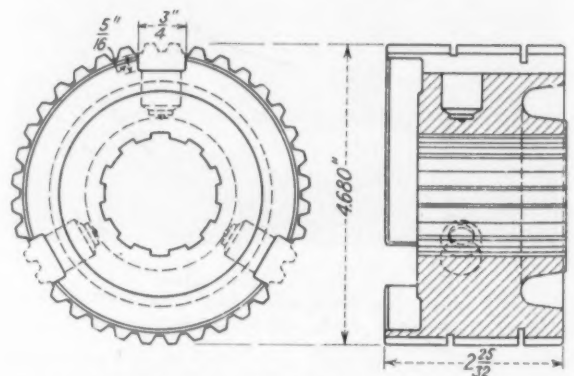
After these operations, the bumper is carried through a cleaning bath prior to copper and nickel plating. Cut and color buffing follows the nicked plating, preparing the surface for the chromium plate.

Deep Slots Automatically Broached in Clutch Hubs

THREE long slots are broached to size and equally spaced around the periphery of transmission synchronizer clutch hubs by a 15-ton, 72-in. stroke, Colonial universal horizontal broach that features completely automatic operation once the parts have been loaded into the machine. Metal removed during this operation is considerable since the slots are $\frac{3}{4}$ x $2 \frac{25}{32}$ x $\frac{5}{16}$ in. in size.

After the part is placed in the fixture and the start button is pressed, the following sequence of operations takes place: (1) The fixture clamps the hub and shuttles into cutting position; (2) the broaches go through the cutting stroke; (3) the fixture shuttles back to unloading position and unclamps; (4) broaches return to cutting position while operator unloads broached parts and loads blank.

A follow-rest is provided for the top broach, and the lower broaches are supported through their entire travel. Design of the machine is



Triple-slotted transmission synchronizer clutch hub showing the amount of metal removed to form the $\frac{3}{4}$ x $2 \frac{25}{32}$ x $\frac{5}{16}$ -in. slots equally spaced around its periphery.

such that these three deep slots can be cut to finished size in one operation and its automatic cycle eliminates manual handling of broaches.

New Precipitation-Hardening Stainless Steels

New sheet and strip applications of stainless are now possible with Armco's new 17-7 PH stainless steel. High strength properties are secured by cold working or precipitation-hardening or a combination of both.



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ARMCO 17-7 PH stainless steel is a precipitation-hardening alloy but differs from 17-4 PH* in that it was especially developed for sheet, strip, plate and wire applications requiring good corrosion resistance combined with extremely high mechanical properties. Also 17-7 PH employs aluminum instead of copper as the precipitation hardening element.

This steel may be supplied in several different conditions depending on the character of the application. It is most ductile in the annealed or soft-temper condition, from which two heat treatments (1400° and 900°F) are required for hardening. From an intermediate heat-treated condition only one hardening treatment at 900°F is necessary.

After cold rolling or cold drawing, precipitation-hardening requires only one heat treatment. Heavy cold reductions followed by the precipitation-hardening treatment result in very high tensile and elastic properties. The principal use for wire appears to be in the high elastic or spring temper condition, which before final hardening is referred to as hard-temper, and fully hardened as extra-hard temper. A typical analysis of Armco 17-7 PH is: C, 0.07; Cr, 17.0; Ni, 7.0; and Al, 1.0 pct.

Similar to Armco 17-4 PH, the corrosion resistance of 17-7 PH approaches that of type 304

stainless steel and is far superior to that of the standard, hardenable, straight-chromium stainless grades.

When 17-7 PH is water quenched after annealing at a temperature between 1800° and 1950°F, it has an austenitic structure similar to that of annealed type 301 and consequently has considerable ductility. This condition is referred to as soft temper. The two heat treatments required to harden this material to a range of 40 to 45 Rc are: (1) 1400°F for ½ to 3 hr and water quench, or air cool and (2) 900° to 950°F for ½ to 1 hr and air cool. After the intermediate 1400°F treatment the hardness is between 26 to 30 Rc.

The 1400°F treatment may be replaced by cold rolling or cold drawing; the final properties will vary with the amount of cold work. Heavy reductions followed by the precipitation-hardening treatment (850° to 900°F) result in hardnesses above 50 Rc and exceptionally high elastic properties.

Like 17-4 PH, 17-7 PH is a marginal austenite-martensite iron-chromium-nickel alloy. However, it has a greater tendency to remain austenitic. The structure in the soft temper condition is essentially austenitic. The intermediate heat treatment or cold working unbalances the aus-

* 17-4 PH stainless was discussed in *THE IRON AGE*, last week as Part I of a two part article.

tenite stability sufficiently to permit transformation of austenite to martensite in a manner similar to that which occurs in annealed 17-4 PH. Further hardening is accomplished by the precipitation of an aluminum rich phase, probably an aluminum-nickel compound. The alloy in both the intermediate and fully hardened condition is magnetic.

Heating 17-7 PH to 850° to 950°F produces only a light discoloration or *heat-tint* which has no dimensional effect. If desired, this slight discoloration can be removed quickly with a 10 pct nitric, 2 pct hydrofluoric acid solution at 110° to 140°F, or by light mechanical polishing. The combination of the 1400° and 900°F treatments produces a light scale, easily removed by acid pickling. The physical properties of 17-7 PH stainless are given in Table VII.

TABLE VII

Physical Properties

Armco 17-7 PH Stainless Steel

	Soft Temper	Hardened by Double Heat Treatment	Extra Hard Temper
Density, G per Cc.....	7.81	7.69	7.67
Electrical resistivity at 25C, Microhm per Cm.....	81	86.5	83.8
Magnetic permeability:			
H = 100.....	3.9	77	70
H = 200.....	3.4	48	43.5
Max.....		111	125
Thermal coefficient of expansion, in. per in. per °F x 10 ⁻⁶			
70 to 200°F.....	8.5	6.2	6.1
70 to 400°F.....	9.0	6.4	6.2
70 to 600°F.....	9.5	6.5	6.4
70 to 800°F.....	9.6	6.7	6.6

Soft temper 17-7 PH stainless steel is available in most of the regularly produced gages and sizes of stainless sheet, strip, and plate. In this condition it can undergo severe forming operations, and its 20 to 40 pct elongation makes it satisfactory for many applications involving deep-drawn parts. To develop its full properties after fabrication, the alloy is first heated at

1400°F for 30 min and air cooled, then heated at 900° to 950°F for 30 min and air cooled. Process annealing between drawing operations should be carried out at 1800° to 1850°F followed by water quenching or air cooling.

By proper sequence of fabrication operations it is sometimes possible to use the 1400°F intermediate treatment as the final process anneal. In the intermediate condition 17-7 PH can be given a limited amount of cold forming, and after final drawing or forming operations only the 900° to 950°F precipitation-hardening treatment need be used.

Mechanical properties of 17-7 PH in the as-supplied (soft temper) condition, and after each treatment in the fabricating plant are shown in Table VIII.

Many manufacturers will be interested in the high compressive yield strength of the new alloy. In conventional, high-tensile, chromium-nickel grades, the longitudinal compressive yield strength may be as much as 25 pct below the yield strength in tension. This fact has been a deterrent to the use of conventional high-tensile stainless steels in several fields, especially aircraft. With hardened soft temper 17-7 PH, both the longitudinal and transverse compressive yield strengths are as high or higher than the yield strength in tension.

Some fatigue data have been obtained on double heat-treated 17-7 PH bar stock. At a stress of between 75,000 and 80,000 psi the material will endure 100,000,000 reversals of stress. It should be pointed out, however, that the data were obtained on polished specimens. In applications where the original surface of the sheet or strip material is not altered, the endurance limit will be lowered, depending on the quality of the surface. Torsion data obtained on bar stock of double heat-treated material indicate that the ranges shown for 17-4 PH in Table III, Part I, are satisfactory for 17-7 PH.

Soft temper 17-7 PH stainless steel can be welded without difficulty by any of the resistance or electric-arc fusion processes regularly used for stainless steels. In welding the regular grades of stainless steel, problems sometimes arise in the heat-affected zones of the parent material. For example, the 18-8 grades are susceptible to corrosion if there is an excessive amount of intergran-

TABLE VIII

Mechanical Properties

Armco 17-7 PH Stainless Steel

Condition	Treatment	Ultimate Tensile Strength, Psi	0.2 Pct Yield Strength, Psi		Elongation in 2 in., Pct	Hardness
			Tension	Compression		
Soft temper.....	As supplied	115,000 to 145,000	35,000 to 45,000	.....	20 to 40	78 to 92 Rb
Intermediate.....	Soft temper + 1400°F, 30 min, AC	125,000 to 145,000	95,000 to 115,000	.....	8 to 12	26 to 30 Rc
Hardened.....	Soft temper + intermediate + 900° to 950°F, 30 min, AC	185,000 to 205,000	160,000 to 190,000	160,000 to 190,000	7 to 12	40 to 50 Rc

Modulus of elasticity, hardened condition, 29,000,000 Psi.

TABLE IX

Gas Shielded Arc Joints

Mechanical Properties of Welded Joints in Armco 17-7 PH Stainless Steel
Prepared by Inert-Gas Shielded-Arc Process Using 17-7 PH Electrodes¹

	(A)	(B)	(C)	(D)	(E)	(F)
	Hot Rolled, Annealed, Intermediate Treatment and Hardened (Unwelded)	Hot Rolled, Welded, Annealed, Intermediate Treatment and Hardened	Hot Rolled, Annealed, Welded, Intermediate Treatment and Hardened	Hot Rolled, Annealed, Intermediate Treatment, Welded and Hardened	Hot Rolled, Annealed, Intermediate Treatment, Hardened and Welded	Hot Rolled, Annealed, Intermediate Treatment, Hardened, Welded, Intermediate Treatment and Hardened
Hardness:						
Parent metal.....	45 Rc	45 Rc	45 Rc	45 Rc	45 Rc	45 Rc
Weld metal.....		45 Rc	45 Rc	90 Rb	85 Rb	47 Rc
Ultimate tensile strength, Psi.....	200,000	198,000	203,000	135,000	127,000	190,000
Elongation, pct in 2 in.....	12.0	12.0	9.0	14.0	12.0	9.0
Location of fracture.....		Base metal	Base metal	Weld metal	Weld metal	Base metal
Efficiency of weld joint, based upon tensile strength, pct.....		98	100	67	63	95

¹ Square-butt joints in 1/4 in. thick plate prepared by argon-shielded tungsten-arc welding using one pass on each side and adding no filler metal.

ular carbide precipitation. Cracking may occur in the plain chromium martensitic grades, if the heat affected zones harden intensely. Neither of these difficulties is encountered in welding 17-7 PH because of the unique microstructural changes which occur during thermal treatment.

In the fusion welding of 17-7 PH stainless steel a small deviation must be made in the customary practice of depositing weld metal of an analysis similar to that of the parent metal. The aluminum in 17-7 PH is easily oxidized during fusion welding, and a substantial amount will be lost as slag unless the arc is efficiently shielded from the air. Shielding provided by the inert-gas shielded-arc and the atomic-hydrogen arc welding processes is satisfactory, and 17-7 PH filler rods or electrodes can be used in either of these processes. Mechanical properties of inert-gas shielded-arc welded joints in 1/4 in. thick 17-7 PH plate are shown in Table IX. It can be seen from these data that soft temper material which has been welded and then hardened by the 1400° and

900°F treatments will have joints with strengths equal to that of the hardened parent metal.

The protection in metal-arc welding with flux-coated electrodes is not quite as good as that in the two arc processes mentioned above, and a significant amount of aluminum would be lacking in the weld deposit. Attempts to produce coated electrodes which contain aluminum additions to compensate for loss by oxidation have not been successful because of side reactions resulting from the aluminum additions. It has been found, however, that 17-7 PH can be successfully welded with coated electrodes of 17-4 PH composition. Since 17-4 PH contains no aluminum satisfactory hardenable welds can be made by the metal arc process. Then, too, the corrosion resistance of 17-4 PH is of the same order as 17-7 PH; therefore there is no problem in this respect. Table X presents further data on welded joints, in 17-7 PH 1/4-in. thick plate, made with 17-4 PH coated electrodes. A significant point revealed by these tests is the behavior of the weld metal when 17-4

TABLE X

Arc Welded Joints

Mechanical Properties of Welded Joints in Armco 17-7 PH Stainless Steel
Prepared by Metal-Arc Process Using Coated Armco 17-4 PH Electrodes¹

	(A)	(B)	(C)	(D)	(E)	(F)
	Hot Rolled, Annealed, Intermediate Treatment and Hardened (Unwelded)	Hot Rolled, Welded, Annealed, Intermediate Treatment and Hardened	Hot Rolled, Annealed, Welded, Intermediate Treatment and Hardened	Hot Rolled, Annealed, Intermediate Treatment, Welded and Hardened	Hot Rolled, Annealed, Intermediate Treatment, Hardened and Welded	Hot Rolled, Annealed, Intermediate Treatment, Hardened, Welded, Intermediate Treatment and Hardened
Hardness:						
Parent metal.....	45 Rc	44 Rc	44 Rc	44 Rc	44 Rc	42 Rc
Weld metal.....		37 Rc	40 Rc	96 Rb	90 Rb	39 Rc
Ultimate tensile strength, Psi.....	200,000	176,800	187,800	145,200	142,500	188,000
Elongation, pct in 2 in.....	12.0	3.9	5.4	6.2	6.2	7.0
Location of fracture.....		Weld metal	Weld metal	Weld metal	Weld metal	Weld metal
Efficiency of weld joint, based upon tensile strength, pct.....		87	94	72	71	94

¹ Double-bevel butt-joints in 1/4 in. thick plate prepared by arc welding with 5/32 in. flux coated electrodes.

PH is deposited on 17-7 PH. The weld metal responds as a double treatment alloy, that is, it requires the intermediate treatment at 1400°F prior to the hardening treatment at 900°F to obtain full hardness. This, of course, is the standard treatment for 17-7 PH, welded in the soft temper condition.

For years manufacturers have wanted a highly corrosion-resistant stainless steel wire, sheet and strip capable of developing elastic properties and hardnesses comparable to high carbon spring steels. Precipitation-hardening 17-7 PH stainless steel fills this need. Properties equal to or better than those for carbon steel music wire can be developed in 17-7 PH wire; while sheet and strip can be produced to give hardnesses of 50 RC or better, tensile strengths of 250,000 psi and higher, and exceptional elastic properties.

Hard temper 17-7 PH is supplied by the mill in the cold rolled or cold drawn condition with a hardness of 42 RC or better depending on the gage. In this condition some fabricating can be done since the material still has substantial ductility. After fabrication, only a single 850° to 900°F heat treatment is necessary to obtain full strength, hardness and elastic properties. This condition is known as extra hard temper. Wire products are also available heat treated at the mill and are designated extra hard temper. The physical properties of extra hard temper material are given in Table VII.

The influence of the precipitation-hardening temperature and time on the elastic properties of extra hard temper 17-7 PH is shown in Fig. 2. The vertical scale indicates the proportional limit in bending as indicated by the Olson stiffness

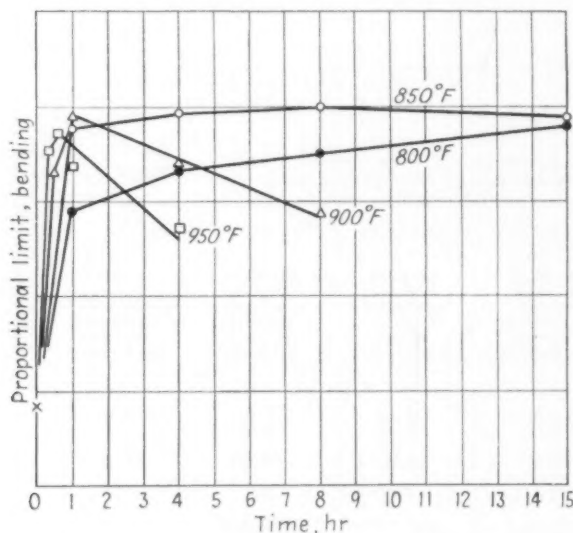


FIG. 2—Influence of precipitation hardening temperatures and times on the elastic properties of Armco 17-7 PH extra hard temper stainless steel.

tester. The exact level of stress cannot be readily determined but each division represents approximately 25,000 psi.

It is obvious from the curves that a 900°F treatment is to some extent critical and should be used only when accurate furnace controls are available. To insure uniformity in large batches without seriously lowering the elastic properties, 850°F for at least 4 hr is recommended.

In the fully hardened condition 17-7 PH wire has sufficient ductility to be wrapped on its diam-

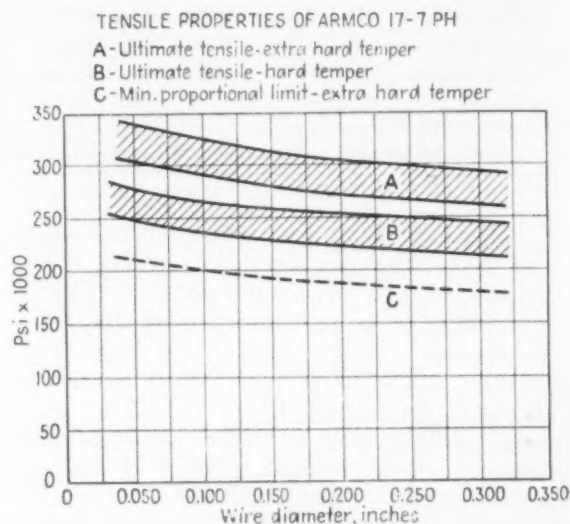
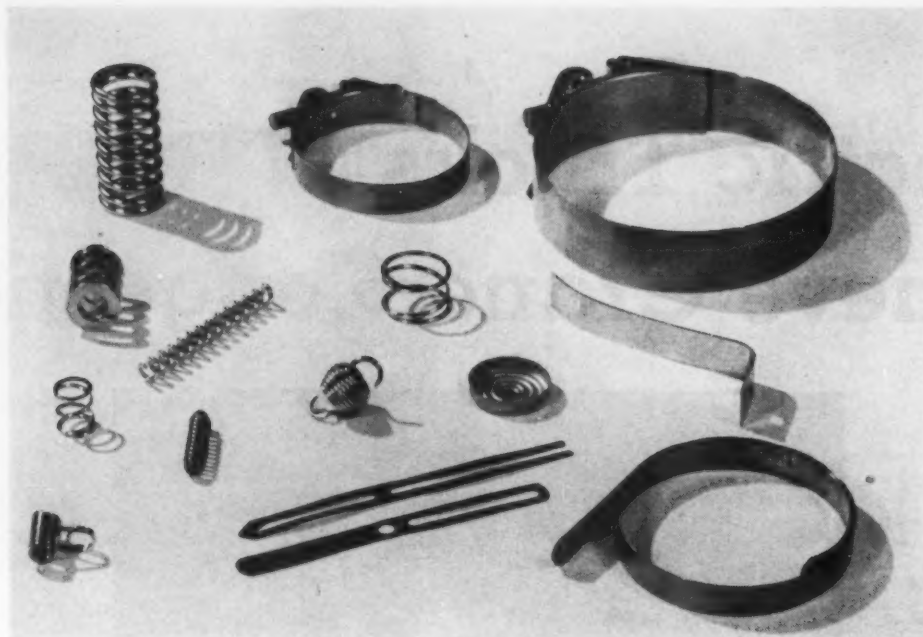


FIG. 3—Tensile properties of various sizes of Armco 17-7 PH wire in both the hard temper and the extra hard temper conditions.

eter. Slightly more difficult forming may be done before the final precipitation-hardening treatment. Coil springs and various shaped surgical trusses have been made successfully from this grade. Mechanical properties of 17-7 PH hard temper and extra hard temper wire from 0.312 in. to 0.030 in. are shown in Table XI.

Fig. 3 shows the range of ultimate tensile strengths in which 17-7 PH wire of various sizes is being produced. The tensile strengths in both the hard temper and the extra hard temper conditions are given. The dotted line indicates the minimum proportional limit to be expected in the extra hard temper condition. Normally the proportional limit is about 70 to 80 pct of the tensile strength. Over the range of sizes indicated in Fig. 3 the 0.2 pct yield strength will vary 2000 to 8000 psi below the tensile strength, while elongation in two inches will vary from 2 to 7 pct, with the larger sizes exhibiting the greatest elongation.

Since fatigue properties of wire depend greatly upon the quality of its surface, numerous tests are underway on various sizes and lots of 17-7 PH wire to determine the range of endurance values to be expected in commercial material.



Potential applications for 17-7 PH stainless.

Rotating beam tests were made on polished bar type specimens machined from 5/16 in. diam wire which has a tensile strength of 275,000 psi. No

definite endurance limit was obtained even after 144,000,000 cycles as shown by the following:

Stress, psi	No. of Cycles
106,000	10,000,000
95,000	40,000,000
80,000	144,000,000

Fabricating characteristics of as-supplied hard temper sheet and strip are roughly comparable to type 301 full hard temper stainless. It can be blanked, punched, flanged, and will take a slight dishing operation such as is performed on simple diaphragms. After fabrication, the exceptional strength and elastic properties are obtained simply by heating to 900°F for 1 hr and air cooling.

Typical properties of 17-7 PH hard temper stainless steel, both in the as-supplied condition and after heat treatment in the fabricator's plant, are shown in Table XII. These properties are indicative of those obtained in the usual gages in which hard temper 17-7 PH is supplied. Because the ultimate properties of the material depend upon the amount of cold reduction it receives at the mill, it is possible to obtain considerably higher values in thinner gages.

TABLE XI

Wire Properties

Mechanical Properties of Armco 17-7 PH Stainless Steel Wire

	Hard Temper	Extra Hard Temper
Ultimate tensile strength, Psi	210,000 to 285,000 ¹	260,000 to 345,000 ¹
Yield strength, 0.2 pct offset, Psi	195,000 to 265,000	250,000 to 340,000
Hardness, Rc.	42 and up	50 and up
Elongation, pct in 2 in.		2 to 7
Proportional limit, Psi		
Tension		175,000 to 210,000
Torsion		150,000 to 180,000
Modulus of elasticity, Psi		
Tension		29,500,000
Torsion		11,000,000

¹ Values within above ranges are largely governed by wire size. For tensile values for specific sizes see Fig. 3.

TABLE XII

Sheet and Strip Properties

Typical Mechanical Properties of Armco 17-7 PH Stainless Steel Sheet and Strip*

	As-Supplied	Fabricator Treated (900°F for 1 hr)
Ultimate tensile strength, Psi	215,000	255,000
Tensile yield strength (0.2 pct offset), Psi	190,000	250,000
Compressive yield strength (0.2 pct offset), Psi		235,000
Proportional limit, Psi		180,000
Elongation in 2 in., pct	3	3
Hardness, Rc.	44	51
Modulus of elasticity, Psi		
Longitudinal		29,500,000
Transverse		32,000,000

* Properties obtained on material 0.045 in. thick.

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Electric Trucks Relieve Crane Congestion

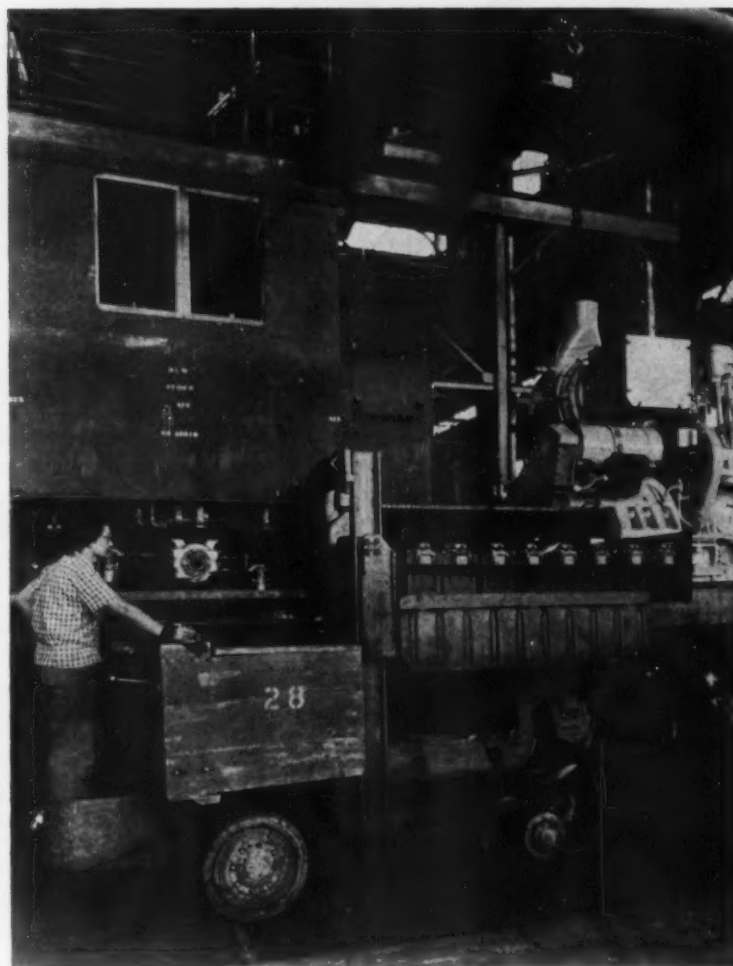


FIG. 1—One of the jobs of a highlift platform truck in the diesel engine plant of Baldwin Locomotive Works is to lift storage batteries to a level where they can be pushed into the battery compartment of diesel locomotives.

MORE than 25 years of experience with platform-type electric trucks used in conjunction with overhead cranes at Baldwin Locomotive Works, Philadelphia, finds the company developing means to use them more effectively in relieving crane operations. In the diesel engine division, for example, where nine of the company's 46 electric trucks are employed, all small-parts bins or tote boxes that were originally designed only for crane pickup are being replaced this year with new steel skid bins. Although some handling of the old bins has been by platform

trucks, it has been necessary to use a crane to place the bins on and take them off truck platforms. Movement of small parts on production lines will be handled entirely by truck, leaving heavier work within their areas to the overhead cranes.

A large part of Baldwin's truck fleet is lowlift platform trucks. In the diesel engine division there are eight lowlift battery-powered trucks and two highlift trucks, one of which is gas-powered. Electric highlift platform trucks have been useful for loading and unloading highway



FIG. 2—Battery-powered platform-lift trucks will handle all small parts in Baldwin diesel engine plant when new skid bins entirely replace tote boxes. Lugs permit handling by overhead crane when necessary.

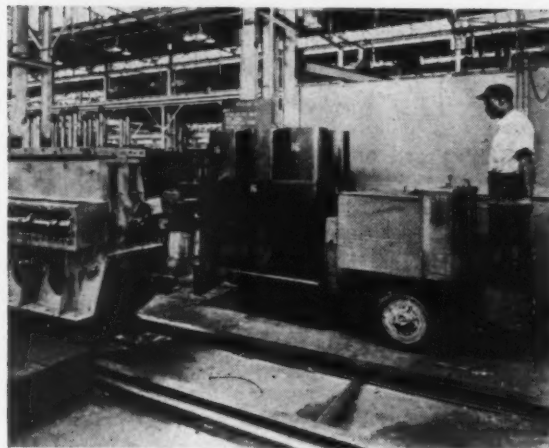
trucks from ground level and for various jobs beyond the reach of the lowlift trucks. For example, a highlift truck handles storage batteries for diesel locomotives, pushing them into place during locomotive assembly, as shown in Fig. 1.

Nearly all battery-powered trucks used at Baldwin are of 4000 lb capacity. Consequently, there have been frequent instances of overloading. This has increased repair maintenance to some extent, but unscheduled loss of service has been negligible and the principal maintenance has been tire replacement and steering gear repair. The effects of overloading and other abuse of battery-powered trucks have been to strengthen preference and respect for this type of truck.

The average run of these trucks is estimated at 150 ft. However, many runs are only 30 to 50 ft and a few are 2000 ft and more. Long hauls are usually handled by tractor-trailer trains that depend on overhead cranes for loading and unloading.

Truck operation is under the direction of labor foremen of the departments to which each truck is assigned. There is no necessity for routing of trucks. Placement of skid bins at machines is facilitated by painted lines on the floor at 45° to the aisles and at points most convenient for ma-

FIG. 3 — Specially designed cabinets that protect piston and rod assemblies are handled by platform trucks after assemblies have been cleaned.



chine operators. Marked aisles assure clear passage for the largest loads.

Skids and tote boxes are of several sizes and types. There are small skids that carry three wooden tote boxes and somewhat larger that hold four and six tote boxes. These are also equipped with lugs for crane handling. Several pans, 4x5x2 ft, are handled by both trucks and cranes.

The newest skid bins are 16x28x60 in. supported at the ends so that two can be carried on a truck platform. These bins, shown in Fig. 2, are Baldwin design and manufacture. Baldwin also designed and built several cabinets on skids, as shown in Fig. 3, for handling diesel engine piston and rod assemblies.

While trucks are in operation 24 hr a day, all trucks in the diesel engine plant can be operated at least one shift before the batteries need to be recharged. Some are operated more than one shift, and only 15 batteries are required to operate nine trucks. The charging station is in the central storage area with the charging bench located so an overhead crane can handle the batteries between truck and bench. Two motor generator sets of 15 and 20 kw capacity can charge from one to eight 21 and 24 cell batteries at one time.

ALUMINUM

Aluminum rod and heavy wire may be drawn either wet or dry in multi-die continuous type machines. Starting with $\frac{3}{8}$ in. diam rod, this may be reduced in one machine to as fine as 0.077 in. for stranding into electrical cable wire; or continuing reductions may be made down to 0.012 in. for weaving into screen wire. Other sizes, intermediate and fine, are being drawn for an increasing number of uses in the electrical, structural, and appliance industries.

Where wire is wet drawn, principally heavy wire, dry powdered soap, drawing grease, or heavy compounded oils are used singly or in alternating die blocks. Soap used is dry powdered sodium soap. Drawing greases are usually calcium based and of a soft consistency to avoid channeling in the lubricant box. Heavy compounded oils contain mineral oil refined stock, some soaps usually stearates, and fatty oils such as tallow, lard oil or degreas. Where lubricants are alternated, dry soap may be alternated with either the grease or compounded mineral oil.

In wet drawing, starting size rod, $\frac{3}{8}$ in. diam, may be drawn using a compounded mineral oil circulated in the machine over the dies and wire. Viscosities of such oils may vary from S.S.U. 400 to 2000 at 100°F. Compounding consists of soaps and fatty oils in amounts from 15 to 40 pct by volume, with bulk oil temperatures ranging from 100° to 190°F. It appears that the higher oil temperatures are usually associated with the heavier viscosity oils, indicating an optimum relationship among viscosity, oil temperature and lubricating characteristics.

Results in service appear to favor the maintenance of bulk temperatures of 140° to 150°F for medium heavy oils in high speed machines. Temperature control can be made through an adjusted volume of oil in the system or by suitable heat exchangers equipped to either cool or heat the oil. It appears that too low a bulk temperature is associated with scratching on the wire and metal pickup, while too high a bulk temperature affects the ability to obtain the desired physical properties in the finished wire.

Filtration of oil in drawing aluminum wire has been attempted, but, except for the use of mechanical type units and screens, has not been encouraging.

Intermediate and fine aluminum wire is drawn in continuous type wet wire machines, identical to those used for drawing steel and copper wire of similar gages. Either neat oils, compounded light viscosity oils or water emulsions and solutions are used. Drawing speeds range from 2000 to 5000 fpm, and dies are carbide or diamond.

Where oil is employed for drawing, it should be light bodied to obtain good circulation, best

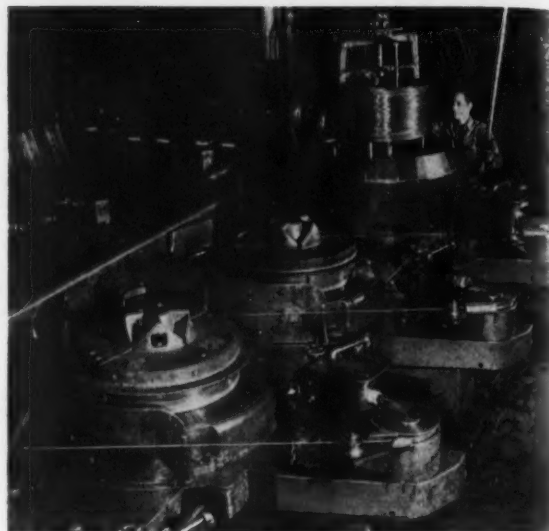


FIG. 6—Aluminum rod may be drawn down to wire gages either wet or dry, with reductions from $\frac{3}{8}$ in. starting rod to as fine as 0.077 in. in continuous type, multi-die machines. Courtesy Aluminum Co. of America.

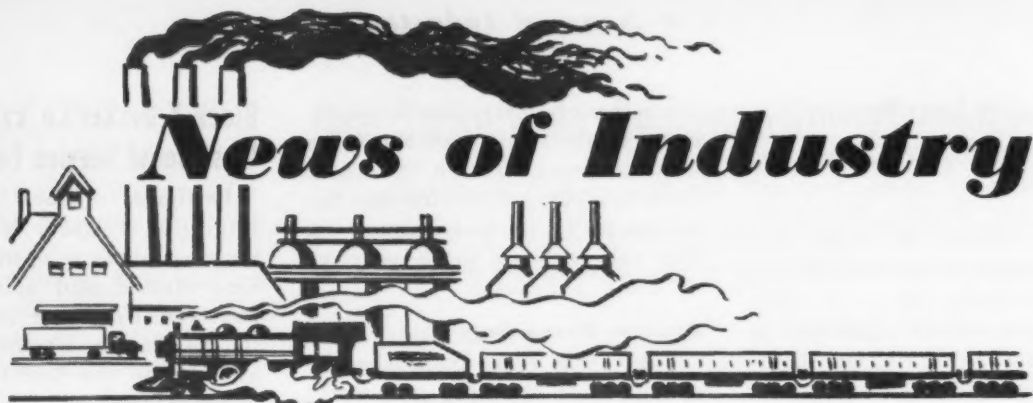
cooling, and fluidity to wet the work. A typical average viscosity used is S.S.U. 100 to 150 at 100°F. To get the best wetting out properties, lubrication at high pressures in drawing, and to facilitate good finish and good die life, the oil is compounded with 10 to 20 pct suitable fatty oil.

While tallow is sometimes used to compound mineral oil, it is not as easily held in homogeneous solution as some other fatty oils such as lard. In any case, a fat with a minimum tendency to settle out is desirable. High free fatty acid contents improve lubrication.

In using emulsions for drawing fine aluminum wire, the starting wire should be precoated by dip, swab, spray or wiper with neat oil used to make up the emulsion. This can be applied ahead of the first die. The circulating emulsions should contain 3 to 5 pct soap-fat oil concentration and be circulated at ambient temperature. Staining characteristics of alkaline water solutions at below boiling temperatures are well known. Hence, the emulsion should have a pH value as close to neutral as possible. If chemically active constituents are used in the neat oil or compound from which the emulsion is made up, concentrations in the emulsion that may cause stains should be avoided. Brighter, better finished aluminum wire is possible with drawing oils than with emulsions.

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News of Industry

A Helping Hand

Chicago—The Gary works of Carnegie-Illinois Steel Corp. is going to share its coal stocks with shivering families in its community.

Coal and coke will be available to employees of U. S. Steel subsidiaries in the area through a special committee of representatives from each company. Distribution to non-employee families in extreme need will be made through another committee including civic officials and coal dealers.

The company has been building its coal stock at Gary for almost a year, stocking all coal it could obtain. Steelmaking operations there have not slumped as they have in other plants.

West Coast Plant to Make Aluminum Building Products

Salem, Ore.—Construction is now under way on a new plant at Salem, Ore., for Western Aluminum Corp., which will manufacture aluminum building products for distribution throughout the Northwest.

Cost of the completed plant will be about \$250,000, according to Carl V. Amussen, president of the new firm and also president of Norpac, Inc., Seattle. The plant, which will produce such aluminum building products as panel roofing and siding, down spouts, aluminum foils and aluminum insulating material, is expected to have an output of about a million sq ft of roofing and siding paneling a month, Mr. Amussen stated.

How Strong Is Steel Demand?

Consumers pressing harder for delivery while steelmakers await coal . . . No return of zany market seen . . . Cost consciousness and doubt check speculation—By BILL PACKARD

New York—While steelmakers await shipments of coal this week, steel consumers are pressing harder for delivery. They are writing letters, using telephones and ringing doorbells. In some cases they are camping on the doorsteps of steel sales offices. Conversion is booming again. And there is proof that the gray market is back, although not on a big scale, tonnagewise.

But there is little hysteria in the market. While the pressure for some items, such as galvanized and cold-rolled sheets, is intense, it is still orderly. Conversion arrangements involving substantial tonnages are being made quietly but methodically.

Gray Market in Reverse

Bulk of conversion activity is being carried on by auto makers, although the appliance and farm implement people are back in the picture, too.

The gray market this time is working in reverse. It doesn't get its impetus from daisy chain peddlers offering their wares. It is caused by consumers with nice contracts who can not get delivery promises on the items they need. So they do the best they can. They start writing letters and ringing telephones of those they think

might have orders on mill books—or might be able to get orders on the books. Naturally, they offer to pay a premium price, put up cash in advance and so on. Some of them are willing to pay as much as \$15 a ton above the mill price. But the tonnage involved is not great enough to cause much turbulence in the market.

Most steel producers and a few consumers are wondering if the market is really as tight as it

Turn to Page 94

Warner Aircraft Co. Merges

Detroit—Merger of Warner Aircraft Co., Detroit, with Clinton Machine Co., Clinton, Mich., has been approved by stockholders of both companies.

The Clinton Machine Co. produces small gasoline engines. Under the terms of the consolidation, the assets of the 22-year-old Warner Aircraft Co. will be absorbed.

ACF Receives 100 Car Order

New York—One hundred covered hopper cars has been ordered from the American Car and Foundry Co. by the Gulf, Mobile and Ohio R.R. The standard design, 70-ton capacity cars will be constructed at ACF's Madison, Ill., plant.

How Strong Is Steel Demand?

Continued from Page 93

seems. They vividly recall the mid-year slump of 1949, the glutted appliance market, the inventory problems and so on. How much of the current tightness in steel should be attributed to effective demand for consumer goods? How much to the steel strike? How much is a hedge against the coal crisis?

An army of industrial oracles and swamis couldn't answer these questions—and offer proof. Crystal balls and ouija boards will serve as well as slide rules, because no consumer who is out prowling for steel will admit that he really doesn't need it. Or that his order is a hedge against the possibility that he won't be able to get it five months hence.

No Zany Market Expected

One thing is certain. The weird activity of two years ago will not return to the steel market in the near future. There are several good reasons for this. By no means the least of them is the buyers' market.

Today, price is important. It will continue to be important because the period of overall shortage of consumer goods has long

since passed. Misjudgment of demand might cause spot shortages in some items. But on the whole there is plenty of merchandise for people to spend their money on. They will continue to be selective in their purchases.

Reverse Psychology

That's why costs and prices are so important. Manufacturing firms are putting all possible heat on cost cutting, so that they can improve their competitive position in pricing their finished products. They know that steel procurement outside regular channels always costs more—that it just isn't possible to resort to conversion or gray market steel sources without increasing costs. They know that the way to sell their goods is to get their costs and prices down.

Strange as it seems, the current scramble for steel also seems to be partly caused by fear among consumers that the market for their products will not hold up all year. The auto makers and appliance people are in a production race with their competitors. They want to get as big a hunk of the market as possible while the getting is good. If the market for their products becomes glutted their steel orders will drop out of sight.

The fact is that most steel consumers have enough steel on hand for current operations. A lot of them would like to have more comfortable inventories. Some of them have been trying unsuccessfully to build up their inventories ever since the strike. If any kind of trouble shuts off their steel they will be forced down quickly. But the real status of steel demand will not be known until a few weeks after the coal strike has ended.

Resume Your Reading on Page 93

Wire Co. Leases Storage Space

Cincinnati—American Steel & Wire Co. has leased 900,000 sq ft of warehouse space in Norwood, Cincinnati suburb. Wire rope and electrical goods will be warehoused at the new installation.

Black & Decker Co. Expands West Coast Service Facilities

Baltimore — Black & Decker Mfg. Co., Towson, Md., has announced plans to open a new service station and sales office in Portland, Ore. The new facilities in the Pacific Northwest are in addition to the Seattle sales and service office.

Gus Nelson and A. W. Escoffier, service engineers, will head the staff.

Newport Steel Sells Tool Div.

Cincinnati—Aircraft Tool Div., Newport Steel Corp., has been purchased by Fred Weiland, Cincinnati attorney, on behalf of Romos Enterprises, for a reported \$1,170,000.

Purchase includes real estate at Elkhart, Ind., all machines, equipment and inventory, according to Mr. Weiland. The firm will continue to operate under the name of Elkhart Machinery Corp.

New Scrap Company Formed

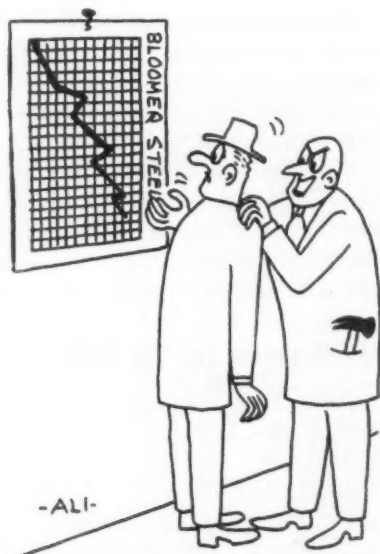
Cincinnati — Formation of the Cincinnati Steel Baling Co., which will specialize in the handling of new sheet clips and old black sheet, has been announced by Roy Adams of Frank Adams & Co.

Principals in the new organization are the Adams interests and David Hirschberg Co., Lockland, Ohio. Both have been active in the local iron and steel scrap industry for the past 35 years.

Cold Extrusion of Steel Is Topic of March Meeting

Cleveland — The first general discussion of cold extrusion of steel will be held here March 16 and 17. Members of the Munitions Board, Ordnance Dept., and civilian organizations are scheduled to speak.

The technical meeting will first consider prejudging and testing metals. Later, steel and aluminum companies will share the program with stampers and manufacturers



"Fred old man, I'd like to loan you the dough, but you can see how business is."

of testing and control equipment. Engineers from Heintz Mfg. Co., Philadelphia, which helped develop the process, will speak. Lubricant and press manufacturers will also appear.

Cold extrusion of steel has not had much public discussion. The Army released some data on it in 1947. On Aug. 4, 1949, THE IRON AGE published the first and only report of what has been done in the field during the past 2 years. The symposium is sponsored by the Pressed Metal Institute, 13210 Shaker Sq., Cleveland 20. It will be held at the Hotel Carter, Cleveland.

Metal and Waste Dealers Meet

New York—The Annual Metal Dealers Div. meeting to be held in conjunction with the convention of the National Assn. of Waste Material Dealers on March 14 at the Waldorf-Astoria, will feature an address by Edwin Horlebein, president, American Foundrymen's Society.

The program will also include action on the proposed revisions in nonferrous scrap metal specifications, a discussion of tariffs by Sidney Danziger of H. Kramer & Co., New York, and the outlook for international trade in scrap nonferrous metals by Herbert Cullen, Office of International Trade, Washington.

Recorder Reduces Freight Loss

Cleveland—A new impact recorder which promises to help reduce freight loss and damage claims is being put into production by Cleveland Impact Recorder, Inc.

Known as the Impact-O-Graph, the instrument registers the degree of motion in three directions, vertical, forward and back, and sidewise. Operated by clockwork through a battery, it will run for 28 days without need for adjustment. Fifty recorders have been finished, 30 are sold and about 100 are in production. The company aims to produce 50 a month. One costs about \$300.

Coal Strike Ends; Congress to Push Inquiry

President Truman will ask for commission to probe "sick" industry . . . Operators look for increased production . . . Contract calls for boost in pay, UMW Welfare Fund increase.

Washington—Congress prepared this week to act on President Truman's request for a government study of the "sick" coal industry.

While the resumption of coal mining brought a sigh of relief from members of both parties on Capitol Hill, congressional leaders began clearing the way to creation of a new commission to investigate the industry.

The settlement early this week of the year-old differences between John L. Lewis and the mine operators brought to an end capitol plans for federal seizure of the mines, but Democratic leaders voiced the belief that Mr. Truman would continue to press Congress for the establishment of a commission to study the mining industry and propose a remedy for its "illness."

Love Defends Industry

But George H. Love, speaking for northern and western operators, denied that the coal industry is a "sick" one.

"This country is one of very few where coal mining is still in private hands operating under a free enterprise system," he stated. "It carried the country's enormous needs during the War and since without government help."

Mr. Love declared the industry is a "modern, aggressive one with three to six times the productivity of the coal industry in any other country, and we are going to do better than that."

Terms of Contract

The important provisions in the new contract signed by Mr. Lewis and the mine operators include the following:

- (1) A pay hike of 70¢ per day, increasing daily pay to \$14.75.
- (2) A boost in payments to the Welfare Fund of 10¢ per

ton, bringing the total to 30¢ per ton.

(3) All payments withheld from the Welfare Fund since the old contract expired must be paid by Mar. 15. An estimated \$5 million is thus due from southern operators.

(4) "Memorial work stoppages" are to be limited to 5 days a year.

(5) Damage suits brought by operators against Mr. Lewis are to be dropped.

(6) Mr. Lewis will continue as chairman of the Welfare fund. New trustee for the operators is Charles Owen, of New York, while Miss Josephine Roche, an employee of the United Mine Workers, is to serve as "neutral trustee."

The "willing and able" clause, formerly a standby in most UMW contracts, does not appear in the new agreement. The new contract extends through June 30, 1952, but either side may terminate it on 30 days notice on or after April 1, 1951.



"— I had a flat . . . No I just used that . . . Ran out of gas . . . No . . . Lessee . . . Held up by train . . . No . . . Ah . . . Car stolen, had to walk . . . No . . ."

Senate-House Group Agrees On Freight Absorption Legislation

Final Vote Set for Next Week; Supreme Court Preparing Decision

Washington—A new attempt to legalize individual freight absorption is expected in Congress next week.

Legislation declaring the right of producers to equalize freight rates without resort to collusion has been approved by a Senate-House conference and awaits final approval by a majority of members of each chamber.

The Supreme Court, meanwhile, is expected to hand down its opinion in a case involving alleged price discrimination by the Standard Oil Co. of Indiana.

Meanwhile, the Federal Trade Commissioners are studying opposing arguments before deciding

whether to accept or reject a proposed steel industry consent order which would end FTC's price fixing charges (THE IRON AGE, Mar. 2, p. 124). This order would end multiple basing point pricing but would permit individual freight absorption.

Commission Counter Proposal

Chances are that the Commissioners will not accept the order in its present form, largely because of the limited findings of fact. Should the order be rejected, the Commission is almost certain to come up with a counter proposal which would also do away with the necessity of a long court battle.

Many observers believe the high court will rule that price discrimination made in good faith to meet the lower price of a competitor is

legal. Should this happen, a portion of the present bill which restates this situation would become unnecessary.

A number of Congressmen, including Senator Douglas, D., Ill., and Representative Patman, D., Tex., still are opposed to legislative solutions to the two-year-old pricing problem. However, key votes in the Senate and the House on earlier tests of the bill disclose overwhelming approval of the legislation.

Cooper-Bessemer Shows Profit

Mt. Vernon, Ohio—Cooper-Bessemer Corp. reported a net profit for the fourth quarter of 1949 of \$975,268, on sales of \$9,819,279. This compares with a net profit of \$1,086,423 in the same period of 1948.

For the full year of 1949 the company's sales totaled \$33,383,671, and net profit \$2,852,251.

Navy to Close Ordnance Plant

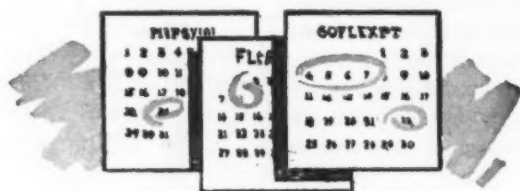
Washington—The naval ordnance plant at Alexandria, Va., will be closed and completely dismantled by June 30, under recent Navy Dept. orders. Necessary functions will be transferred to other active Navy establishments. Some machine tools and other equipment will likewise be transferred and the remainder placed in storage.

Woodward Shows Record Earnings

Birmingham—Woodward Iron Co. has reported record high earnings of \$5,212,305. This compares with net income of \$5,194,553 or \$7.36 per share for 1948. Sales of pig iron reached a peak of 523,454 gross tons, an increase of 1218 tons over the previous high of 522,236 in 1947.

300 Phosphate Cars Ordered

Bessemer, Ala.—An order for 300 phosphate cars has been placed with the Pullman-Standard Car Mfg. Co. by the Seaboard Air Line R.R. The cars are scheduled to be built in May or June.



• Give to the Red Cross •

Dates to Remember

- Mar. 14-16 Society of Automotive Engineers, passenger car, body and production meeting, Detroit.
- Mar. 16-17 Pressed Metal Institute, technical symposium, Cleveland.
- Mar. 20-25 Concrete Reinforcing Steel Institute, annual meeting, Houston.
- Mar. 21-22 Steel Founders' Society of America, annual meeting, Chicago.
- Apr. 3-4 Assn. of Iron & Steel Engineers, spring conference, Birmingham.
- Apr. 4 Society for Applied Spectroscopy, meeting, New York.
- Apr. 4-7 National Assn. of Corrosion Engineers, annual conference, St. Louis.
- Apr. 4-8 Chicago Technical Societies Council, national production exposition, Chicago.
- Apr. 5-7 American Institute of Electrical Engineers, conference on electric welding, Detroit.
- Apr. 5-7 Midwest Power Conference, Chicago.
- Apr. 10-12 American Institute of Mining & Metallurgical Engineers, annual openhearth, blast furnace, coke oven and raw materials conference, Cincinnati.
- Apr. 10-12 American Society of Lubrication Engineers, annual convention, Detroit.
- Apr. 10-14 American Society of Tool Engineers, industrial cost-cutting exposition, Philadelphia.
- Apr. 11-12 American Zinc Institute, annual meeting, St. Louis.
- Apr. 12-14 American Society of Mechanical Engineers, spring meeting, Washington.
- Apr. 12-14 National Petroleum Assn., semiannual meeting, Cleveland.
- Apr. 24 Packaging Machinery Manufacturers Institute, semiannual meeting, Chicago.
- Apr. 25-26 Metal Powder Assn., annual metal powder show, Detroit.
- Apr. 27-28 American Steel Warehouse Assn., annual meeting, Houston.

New Pipe Testing Machine Features Push-Button Control

Pittsburgh—A fully automatic hydrostatic pipe testing machine with push-button control, the first of its kind, was unveiled here recently to pipe manufacturers by the Taylor-Wilson Manufacturing Co., Pittsburgh engineering firm.

Of radically different design than other pipe testing machines, the Taylor-Wilson bench can be operated at speeds in accord with customer's requirements in lengths up to 50 ft., with a minimum of setting up time due to greatly simplified adjustment mechanism.

Other recent developments by the company include a newly-engineered mill for the production of soap chips, plus a new type straightener for heavy wall pipe which reduces to a minimum any changes in the physical properties of the steel after straightening.

Landis Co. Gets Grinding Patent

Philadelphia — The Landis Machine Co., Waynesboro, Pa., was recently notified that the United States Patent office has granted a patent covering a centerless thread grinding process to C. W. Hopkins, Landis Co. chief engineer, who has assigned the patent to the company.

Straus Named Aid to Harriman

Washington — Ralph I. Straus, formerly with the War Production Board and Board of Economic Warfare, has been named special assistant to W. Averill Harriman, Marshall Plan representative in Europe. His job will be to promote European trade to the dollar countries.

Ill. Tech Gets Research Grant

Chicago—A research grant for investigation of sigma phase formation in heat resisting steels has been made to the Illinois Institute of Technology by the Allegheny Ludlum Corp.

INDUSTRIAL SHORTS

ALL IN ONE—American Brake Shoe Co., New York, has announced the consolidation of all operations of its Canadian subsidiaries into one corporation, the DOMINION BRAKE SHOE CO., LTD., a wholly owned subsidiary. The new corporation will make its principal office at 1405 Peel St., Montreal.

EXPANDS FACILITIES—Approximately 300 acres of unimproved land near Joliet, Ill., has been acquired by the CATERPILLAR TRACTOR CO., Peoria, Ill. Construction of a new factory will be started immediately. T. R. Farley, vice-president of the company, will become general manager of the new plant.

RESEARCH GRANT—A \$1300 research grant has been made to Illinois Institute of Technology by the ALLEGHENY LUDLUM STEEL CORP., Brackenridge, Pa., for fundamental research in sigma phase formation in heat resisting steels.

HUSSEY BUYS — Majestic Flashing Co., a division of Fingles Co., Baltimore, has been purchased by C. G. HUSSEY & CO., Pittsburgh. Production equipment is being moved to Pittsburgh where Majestic copper flashing will be produced and marketed through Hussey warehouse facilities.

DOUBLES CAPACITY—An additional plant at East Liverpool, Ohio, has been acquired by the DACAR CHEMICAL PRODUCTS CO., Pittsburgh. The new plant will provide approximately 50 pct increased capacity.

SERVICE STATION — A new service station and sales office at 1640 N.W. Johnson St., Portland, Ore., will be opened on Mar. 13 by the BLACK & DECKER MFG. CO., Towson, Md. Gus Nelson, service engineer, and A. W. Escoffier, sales engineer, will be in charge of the new station.

ADDS FOUNDRY DIV. — The O. D. Conover Engineering Co., Cleveland, foundry design and construction firm, has been acquired by the H. K. FERGUSON CO. The Conover staff will form the nucleus of a newly-established Foundry Div. of the Ferguson company and will be headed by Oliver D. Conover.

NEW COMPANY—The Gerity-Michigan Corp., Adrian, Mich., has been appointed by the recently formed PROZITE CO., Calumet, Mich., as their exclusive national sales agent for its new line of buffing and polishing compositions. The Prozite Co. is jointly owned by Poor & Co., Chicago and Calumet & Hecla Consolidated Copper Co., Calumet, Mich.

TAKES OVER—Establishment of a new division has been announced by AMERICAN MACHINE & METALS, INC., East Moline, Ill., through the acquisition of the Gotham Instrument Co., Inc., New York. The Gotham company manufactures industrial recording and controlling instruments.

TRUCK DISTRIBUTOR — The Automatic Transportation Co., Chicago, has named NOOK & O'NEILL, INC., Cleveland, its northwestern Ohio distributor for their skylift and transporter lines of materials handling trucks.

ACQUISITION — The Chicago Retort & Fire Brick Co., Ottawa, Ill., has been acquired by the LACLEDE-CHRISTY CO., St. Louis, refractories manufacturer.

CHANGE OF ADDRESS—Announcement has been made by BROWN-WALES CO., steel warehouse distributors, that they have moved to their new warehouse and office building on Rindge Ave. Extension in Cambridge, Mass.



FOUNDERS TEAM: Members of the U. K. Gray Iron Founders Team observe a core blowing machine at work in Crane Co.'s steel foundry during a tour of the plant.

Foundry Methods Impress British Observers

Group finds American industry production conscious all down the line . . . Elaborate training facilities also impress . . . Small orders handicap British—By GENE BEAUDET

New York—American industry is production conscious right down the line from management to foreman to worker. That, in the opinion of Samuel Russel, leader of the British gray iron founders' team which has just completed a six-week tour of 16 American foundries, is the reason for the high production rate achieved by American industry.

Aim to Increase Output

The big job of the team when it returns to England will be to reform the psychological attitude of management to make them productivity minded. More attention must be paid to motion study, plant layout, production control and the adequate servicing of skilled labor.

Designed to aid the United Kingdom's effort to increase production of gray iron castings, the team's visit was arranged by the Anglo-American Council on Productivity and the British Government as an ECA technical assistance project.

Prior to their American tour the

team toured 34 foundries in England to increase their background and perfect a system of reporting which they used in American plants. The team of 15 members was split into three groups each of which had a specific problem to study. After every visit the groups prepared separate reports which were then combined. Their studies covered such phases as ore handling, technical control, materials control, and dispatching. In fact they followed every phase, from buying of raw materials to delivery of finished products to the consumer.

Training Facilities Cited

Mr. Russel was deeply impressed by the elaborate training facilities he found in American plants. He cited them as further evidence of the progressive mind of American management. Americans seem more successful in starting a man at the bottom and raising him to an executive level at an early age. This makes for better understanding of the worker's problems by those on the man-

agement level. He claimed that English schooling is too academic and its graduates are not as adaptable to industry as American youths.

However, the passage of information was not entirely one way. One authority on molding sands was able to impart helpful information to American workers.

Britain Lacks Big Market

Britain's biggest disadvantage, according to G. W. Nicholls, chief metallurgist of Modern Foundries Ltd., lies in the lack of capital and a large market. Because capital is scarce little money can be obtained for improving equipment and methods. Even if capital were available many producers would hesitate to employ it because costs resulting from improved facilities would not be sufficiently offset by large scale orders.

According to Mr. Nicholls the high rate of taxation is destroying the English worker's desire to produce. A man will not strive as hard to earn more when he knows that his increased earnings will be heavily taxed.

Movies Will Help

Mr. Nicholls found better cooperation in the U. S. between designers, pattern makers and the man that makes the casting. He also found that American patterns are of higher quality. With a high quality pattern less patching of the sand mold is needed and a higher production is achieved.

Mr. Nicholls has taken motion pictures of plant operations in American factories. He plans to use them to supplement lectures he will give at British foundries on his experiences in American plants. The other members of the team will also tour English foundries in an attempt to increase the productivity of small plants.

It was pointed out that while there are many top notch gray iron foundries in England the difference between the good ones and poor ones is much greater than in America. It is the team's purpose to close that gap.

Proposed Rail Rates May Help Pittsburgh

New rates would cut disadvantage in shipping to Detroit and Eastern points . . . Proposal viewed as bid for Detroit business . . . Shippers being consulted—By JOHN DELANEY

Pittsburgh—The railroads' proposal to effect a special rate reduction on iron and steel shipments of 80,000 lb or more per car to meet the competition of highway carriers will improve the relative position of Pittsburgh steel producers shipping into the Detroit and Eastern consuming areas.

It is the first time since 1917, when the first of a succession of freight rate increases was put into effect, that Pittsburgh mills have not found themselves on the short end of a freight rate change. This is because the increases were on a flat percentage basis and thus Pittsburgh mills were hit hardest. Effect of the proposed 80,000 lb carload rates will be just the opposite in most cases.

Will Cut Disadvantage

While Pittsburgh mills will continue to be at a disadvantage in relation to mills closer to the Detroit and Eastern markets, the railroads' proposal will in some cases reduce the differential enjoyed by the nearby producers.

For example, Chicago mills can move finished steel into Detroit by water for \$2.45 per net ton, the common carrier rate. This does not include 10¢ per ton at origin and destination for use of boat cranes, if the shipper has no facilities. A shipment from Pittsburgh to Detroit by rail is now 51¢ per 100 lb or \$10.20 per net ton—a differential of \$7.75 per ton. The proposed minimum rate from Pittsburgh to Detroit would be 35¢ per ton, or \$7.00, which would reduce the differential to \$4.55. If the water carriers go through with a proposed rate increase, the differential will be reduced even further.

The rail rate from Chicago to Detroit would be reduced from 48

to 33¢, a reduction of 15¢, compared to Pittsburgh's reduction of 16¢. The Cleveland-to-Detroit rate would be reduced 12¢; the Youngstown-to-Detroit rate 13¢; the Canton-to-Detroit rate 13¢; the Buffalo-to-Detroit rate 13.5¢.

Pittsburgh Mills Will Benefit

In some New England consuming areas, Pittsburgh mills will benefit, but the net effect there might be to the disadvantage of local mills. For example, on shipments to Hartford, Conn., Pittsburgh will stand to gain 1¢ per 100 lb, as compared to Bethlehem, Pa., but on shipments into Boston, Pittsburgh will lose 4¢ per 100 lb to Bethlehem.

As compared with Bethlehem as the originating point, Pittsburgh

BRUSH OFF: Operating off a brush lathe this 16-in. diam Tampico section, made by the Osborn Mfg. Co., Cleveland, speeds the finishing of stainless and carbon golf iron heads. The brush blends imperfections and surface irregularities rather than actually removing metal.



will gain 5¢ per 100 lb on shipments into Newark; 5¢ on shipments to Philadelphia; 3.5¢ to New York City, and 6¢ to Baltimore.

Numerous other instances where Pittsburgh stands to benefit on shipments into Eastern markets could be cited.

Other Points Will Benefit

Other producing points than Pittsburgh also will benefit from the changes, of course.

The iron and steel articles thus far listed as coming under the proposed 80,000 lb minimum carload rate are those now being trucked in large volume and which can be loaded to the minimum in cars. The list is not as complete, however, as some producers would like, and chances are the railroads will be asked to expand on it. Nails and wire, for example, are being trucked in large volume and can be loaded to the 80,000 lb minimum, but they were not on the original list.

It was noted that many of the articles listed are used by the automobile industry. Generally, the list includes flat-rolled items, bars, and pipe 6-in. in diam or less.

The proposed rates will not apply on shipments given fabrication in transit arrangements. Export rates will be proposed later.

Truckers May Retaliate

There was little doubt among steel men here that the railroads' proposal will hurt the truckers unless they make a retaliatory move. The truckers have proposed a 15 pct average increase in rates for Mar. 15, but it was believed that in the face of the railroads' action they might consider modifying the proposed boost, despite the fact that their own costs have risen.

Shippers will have an opportunity to express their views on the railroads' proposal at a meeting here today (Mar. 9). After that, the proposal will be submitted to the Interstate Commerce Commission for approval.

January Chicago Business Index Holds at 1949 Level

Chicago—Chicago area business was about the same in the first month of 1950 as in the same month of 1949, as shown by major business level yardsticks. Lines showing increases were electric power generation, bank clearings, number of construction awards and postal receipts.

Lower were bank debits to individual accounts, and outstanding bank loans. Steel production was slightly under the previous year's January total.

Yugoslavia Gets Loan For Purchase of Capital Goods

Washington—The Export-Import Bank has granted an additional loan of \$20 million to Yugoslavia.

The new loan, which brings Yugoslavia's total indebtedness to the Export-Import Bank to \$40 million, is to be spent in the U. S. for capital equipment, spare parts, machinery and materials.

Purchases by Yugoslavia under the two \$20 million credits may be made until Mar. 30, 1951.

The earlier loan, granted by the bank in September, 1949, is partly earmarked for rehabilitation of Yugoslavia's nonferrous mines. The southern European nation is one of the world's leading producers of Bauxite, mercury, copper, lead, and zinc.

The two loans bear 3½ pct interest and will be amortized in 14 equal semi-equal installments beginning in 1954.

New Equipment for Harnischfeger

Milwaukee—A new type high temperature oven has recently been placed in service at the Harnischfeger Corp. electrode plant here. The oven is designed especially for continuous drying and conditioning of extrusion coated low hydrogen and stainless steel welding electrodes.

The oven has six separate temperature zones and a possible tem-

perature variation from room up to 1000°F. Each zone is equipped with separate humidity, temperature and speed controls. Processing time can be varied from 20 to 120 min.

A new extrusion press has been installed to take care of the full capacity of the drying oven.

Blaw-Knox Backlog Shrinks

Pittsburgh—Blaw-Knox Co. earnings for 1949 amounted to \$3,538,408 or \$2.15 per share on the common stock, compared with \$4,050,895 or \$2.85 per share in 1948. Total shipments and billings in 1949 were \$66,280,003 as compared to the peacetime record of \$68,728,473 in 1948.

The company's backlog of unfilled orders declined from \$39 million at the beginning of the year to \$21 million at year's end.

AISE Schedules Annual Meeting

Pittsburgh—Approximately 40 papers on steel mill engineering, operation, and maintenance will be delivered at the technical sessions of the Assn. of Iron and Steel Engineers annual convention Sept. 26-29 at the Cleveland Public Auditorium, Cleveland.

The bi-annual Iron and Steel Exposition will be held at the same time.



"Why not give it the acid test?—Take it home and let your wife drive it."

ECA Funds to Modernize German Coal Mining Industry

Washington—About \$37.5 million in counterpart funds is being made available by the Economic Cooperation Administration for loans to German coal mining companies to step up production.

German hard coal output in December averaged about 360,000 metric tons daily. Modernization of mines with American equipment is expected to increase this average to 450,000 tons by June 1953.

Exports are also expected to increase. Last year, about a fifth of all salable coal, or about 20 million tons, was exported.

Some \$17.5 million of the proposed loans have already been set aside for 44 firms operating mostly in the Cologne, Essen and Aachen areas. The remainder will be allocated shortly.

Service Steel Buys Warehouse

Pittsburgh—The Edgar T. Ward Sons Co. warehouse at Buffalo has been sold to the Service Steel Co., Detroit, by the Columbia Steel and Shafting Co.

High freight costs on shipments of cold finished steel bars from Pittsburgh to Buffalo make it impossible to compete in that area with Buffalo producers, said E. L. Parker, Columbia president, in giving the reason for the sale.

Service Steel Co. will integrate the warehouse with its present operations in Buffalo.

Portsmouth Earnings Unaffected

Cleveland—A new high in net income for the Portsmouth Steel Co. was announced when the company reported 1949 net earnings of \$5,135,424. The Portsmouth announcement stated that the company was able to realize an increased profit while most of the other companies' income declined because it was able to maintain normal operations while most of the industry was closed down during the nation-wide steel strike last fall.

Inland Contest Promotes Interest in Stock Ownership

Chicago—A contest for employees and employees' children in which the prizes will be shares of company stock has been announced by the Inland Steel Co.

Purpose of the contest is to stimulate interest in a series of articles in the company publication for employees explaining the reasons for and the facts of stock ownership.

Prizes for Best Models

The prizes, consisting of 50 shares of Inland common stock worth approximately \$5,000 at current market quotations, will be awarded for the best models of the new Inland ore carrier, the S.S. Wilfred Sykes. Various classifications will permit fair opportunity for children as well as inexperienced and expert adult craftsmen.

The articles in the company's employee news magazine cover such subjects as why a company sells common stock, who are typical owners of Inland stock, and how purchases are made through a stock exchange. They are intended to help clear up the many common misunderstandings about the facts of stock ownership and dividend payments.

Fear Skilled Labor Shortage

Washington—A shortage of skilled labor is a definite probability within the next few years in the opinion of the Labor Dept.

Director W. F. Patterson of the Apprenticeship Bureau says that skilled laborers are not being turned out fast enough to keep up with attrition.

Western Pipe Making Studied

San Francisco—Western methods of fabricating large diameter, electrically expanded steel pipe for high pressure transmission of natural gas were studied for a week by 43 members of the National Tube Co., a U. S. Steel subsidiary.

They were flown by chartered plane on Feb. 19 to San Francisco

where they conducted the study at the Consolidated Western Steel Corp. The fabricating techniques under observation will be applied in a new plant being erected by the National Tube Co. at McKeesport, Pa.

Business for Railroad Car Co.

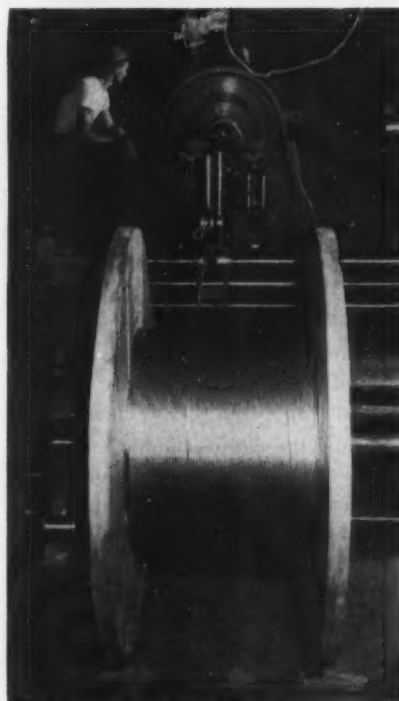
Greenville, Pa.—An order for 250 box cars—the first since early 1949—was received by the Greenville Steel Car Co. from the Detroit, Toledo & Ironton Railroad Co.

Operations will be stepped up and workmen rehired to handle the new business. The company has been employing only about 50 to 100 men since last December. Its normal working force is about 600.

New Security Sales Drop in '49

Washington—Industry received almost \$1 billion less from the sale of new securities in 1949 than in 1948. The Securities and Exchange Commission reports offerings amounting to \$6.2 billion during 1949, as compared with \$7.1 for the previous year.

WOODEN SPOOLS: Finished aluminum cable winds onto big wooden spools after emerging from whirling cable stranding machines at Permanente Metals' new Newark, Ohio Plant.



Westinghouse Electric Corp. Reports Steel Stocks Adequate

New York—The inventory problems which had bothered his firm last year have been pretty well licked, according to Gwilym A. Price, president, Westinghouse Electric Corp. Steel stocks of the company today are about normal and the coal situation is not too serious as far as Westinghouse is concerned. However, lack of coal may force some of the company's suppliers to stop shipments.

The new line of appliances for 1950 have already been announced. The initial ordering was so heavy that all refrigerators, ranges, dishwashers, Laundromats and electric clothes dryers had to be put on allotment. Mr. Price expects the situation to continue for the first half of the year.

Consumer products amounted to 26 pct of the company's 1949 sales. First quarter business was about the same as the last quarter of 1949 and well above last year's first quarter.

Net income for the year was \$67,268,555 compared with a net income in 1948 of \$55,656,351. This is the highest income in the company's history and was achieved despite a moderate reduction in net sales. Mr. Price attributed this to more efficient manufacturing facilities, operating economies and teamwork among employees.

New ECA Purchases Approved

Washington—Approval of \$40 million in Marshall Plan purchases during the last half of February brought the total authorized to date to \$8.3 billion. Included was \$11.4 million worth of machinery, equipment and vehicles.

Among the major individual authorizations were: Austria, \$800,000, construction and mining equipment, and \$250,000, machine tools; Norway, \$800,000 worth of vehicles, engines and parts, and \$150,000 worth of metalworking equipment; and Germany, \$265,000 for metalworking machinery.

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Is This the Goal?"

SO much has been said so often about the high cost of government that the subject is worn thin. It droops like a pair of pants that has never had a day off. Subjects, like garments, can lose their shape and their appeal by over-emphasis and constant use.

As an editorial subject, taxation is particularly open to such abuse. Rare indeed is the taxpayer who believes that the government can spend his money to better advantage than he can himself.

Such conviction is likely to vary with the size of the income subject to Treasury impost. Demands for tax cuts are greeted with the loudest huzzas by Park Ave. income brackets. They are not good form at a C.I.O. rally, among professional welfare workers or advocates of higher living standards for Zulus.

Lower taxes and government economy are in a sense class issues. Attitudes, to a degree, depend upon direct interest. They are only mildly influenced by the more serious effects on the economy and the form of our government.

If this is a fault, the intelligent and the well-to-do must share in it just as much as the bleeding hearts and the rabble-rousers. The criterion of tolerable taxation has too often been geared to the single repetitious chant: "They are too high."

Back in the twenties, with Calvin Coolidge in the White House and Andrew Mellon in the Treasury, and the total cost of federal government less than the amount we will this year provide for foreign aid, the U. S. Chamber of Commerce had a regular Sunday evening broadcast, the unvarying theme of which was: "Government costs too much."

Now that the wolf is really rais-

ing havoc in the flock, the frantic yells of the shepherd are met by yawns. For there can be little doubt that government costs have reached a dangerous point or that official and public opinion is disturbingly complacent.

We have before us a study by the Brookings Institution on "The Cost and Financing of Social Security." As every informed person already knows, the current annual cost of all government in this country now amounts to \$52 billion, approximately 25 pct of the national income. During the current fiscal year the federal government will fail to meet its costs by \$5.6 billion. Next year a deficit of \$5.1 billion is projected.

In spite of this, there seems to be no end to new proposals to increase the financial burden. Compulsory and universal health insurance, in spite of British experience, is now being urged by a highly vocal faction of the Administration. The Brannon Plan would punch another big hole in the federal purse. Operation Myopia, otherwise known as Point Four, would saddle further billions upon the American taxpayer.

What is too much? Are we simply grouching because we have a congenital reluctance to pay taxes? There is no scientific answer. There is no sharp line between what is bearable and desirable and what is intolerable and dangerous.

However, the Brookings Institution points out that in 1970, assuming continued growth in government costs during the next two decades at the rate of the last five decades, "the overall costs of government would perhaps approach 140 billions."

Under the most favorable assumptions the total national income in 1970 might be \$400 billion. This would leave the tax burden at 35 pct. At that level it will approximate the burden which the British now bear. Is that where we are heading?

January Employment Level Falls Below Last December

New York — Manufacturing industries in New York State employed an estimated 1,752,000 wage and salary workers in January—29,000 less than in December and 42,700 fewer than in January a year ago—according to Edward Corsi, industrial commissioner.

Relatively slight losses were reported by producers of fabricated metal products, electrical machinery and transportation equipment. Small gains were recorded by machinery and primary metals producers.

Rotor Tool Announces New Line

Cleveland—A complete new line of 15 "Multi-Power" chipping hammers has been announced by the Rotor Tool Co., Cleveland. These hammers provide 15 different combinations of speed, stroke and blow, giving the user a wide range of hammer performance from which to select the chipper best suited to his job.

Baker-Raulang Holds Open House

Cleveland—More than 700 members of families of Baker-Raulang Co. employees attended the first open house in the 97-year history of the company here this week.

Tool Steel Activities Combined

Syracuse, N. Y.—Centralized headquarters for tool steel sales of the Crucible Steel Co. of America have been established at Sanderson-Halcomb Works, according to H. M. Givens, Jr., general manager of tool and high speed steel sales.

The relocation of tool steel sales headquarters from New York to Syracuse combines tool steel sales activities with production, research and development departments.

This is the latest step in Crucible's three year modernization and expansion program. The Sander-

son-Halcomb Works represents the integration of tool and specialty steel facilities formerly operated in three smaller plants.

An area of 70,000 sq ft is covered by a new master warehouse located at the Syracuse plant. This

new warehouse, which also stocks products of Crucible's other mills, is one of the three new pool warehouses installed at principal plants. It becomes part of the country's largest tool and specialty steel warehouse system.

Industry Widens Uses of Aluminum Tubing

Postwar advances make greater use of aluminum tubing possible . . . Aluminum heat exchangers prove excellent for certain chemical installations.—By JOHN ANTHONY

New York—Many new markets for aluminum have opened up since the end of the war. But one of the established prewar markets has gained tremendous new potential due to the development of new aluminum products and new techniques of fabrication.

In the postwar years to date, about 250,000 lb of aluminum have been consumed by the heat exchanger market. Observers believe that the year 1950 alone may see the consumption of an equivalent tonnage or more by this market, provided the level of general business continues. By way of comparison, the total consumption of the market in all of the prewar years was 10,000 lb.

Aluminum tubing has long been used in the heat exchanger field except for installations operating at high temperatures and pressures. Aluminum offers the advantage of low cost, good heat transfer properties and resistance to corrosion and oxidation. But the real expansion in the market has awaited postwar advances.

Sub-Zero Properties Good

Typical installations include vapor recovery condensers, lube oil coolers, hydrogen sulfide gas coolers, furfural condensers, MEA solution coolers and exchangers, and MEK service. The sub-zero physical and mechanical properties of aluminum are very good. There is an improvement in strength and ductility at low temperatures. At room temperatures, for example, 61S offers a tensile strength of 45,000 psi with an elongation of 17 pct. At minus 320°F, a tensile

of 60,000 psi may be realized, with ductility of 22 pct.

Aluminum heat exchangers are a natural for certain chemical and petroleum industry installations. These include plants for the synthesis of gasoline from natural gas and other petrochemical plants. The oxygen plant now under construction for Carthage Hydrocol, Inc., New York, at Brownsville, Tex., has 7200 aluminum tubes in each of the six large exchangers. The fractionating towers and the smaller exchangers also make use of aluminum tubing and plates. Foster Wheeler Corp., New York, was the builder of much of this equipment.

Lining Prevents Pitting

Production of Alclad aluminum in the form of tubing by the Aluminum Co. of America was one of the principal spurs toward an expanded market in this field. Cooling waters that contain traces of heavy metal such as copper or tin may develop a type of concentration cell action that attacks aluminum by pitting. The pure aluminum lining of the Alclad tubing protects against such electrolytic corrosion, thereby extending the usefulness of aluminum. This type of tubing is cold-drawn from extruded blooms, thereby bonding the cladding metalurgically to the alloy and maintaining close gage tolerances.

Standard Fittings Offered

Another development in the tubing field offers the advantage of much greater exposed surfaces both inside and outside and facilitates heat transfer. This is a new type of hollow extruded tubing

with longitudinal fins on the external and internal surfaces. The cost is reported to be only slightly higher than ordinary extrusions.

Until a few years ago it was necessary for a designer working with an aluminum installation to develop his own special fittings at a heavy cost for tooling. Now several manufacturers offer a complete line of standard and large sized fittings, such as flanges, tees, caps, stub ends, reducers, manways, ell's, etc. Tube Turns, Inc., Louisville, Ky., offers a complete line of fittings in 3S and 61S. Taylor Forge & Pipe Works, Chicago, also offers certain aluminum fittings. Lukens Steel Co., Coatesville, Pa., will produce very large aluminum tank heads. Midwest Piping & Supply Co., St. Louis, produces large aluminum pipe up to 42 in. diam.

Operators Overstressed Joints

One of the prewar handicaps to greater use of aluminum in the heat exchanger field was the difficulty of obtaining uniformly strong and tight joints between tubing and tube sheets quickly and economically. Operators of conventional tube expanding equipment were accustomed to working in steel or high tensile alloys. They were apt to overstress the joint, creating an undesirable stress concentration. So operators were inclined to ease off on the power. This built up time and cost.

Toward the end of the war electronic tube expanding equipment was developed by the Franklin Mfg. Co., Philadelphia, and others. With this type of equipment, expanded joints with maximum strength and uniformity can be produced in aluminum or other metals at a maximum speed. The equipment is set to a predetermined stress, at which point it shuts off automatically.

Most large exchanger installations require the use of heavy plate which must be welded or bolted with flange joints. Linde Air Products Co., New York, has developed a technique for welding 1½ in. thick aluminum plate automatically in two passes. It uses an argon gas shielded arc.

Construction Steel News

Fabricated steel awards this week included the following:

- 1150 Tons, Chesterfield, Va., switchyard for Virginia Electric and Power Co., through Stone and Webster Engineering Corp., Boston, to Bethlehem Fabricators, Bethlehem.
- 540 Tons, Laramie, Wyo., field house, to Omaha Steel Works, Omaha.
- 515 Tons, Chicago, Central Wax Paper Co. plant, to Vierling Steel Works, Chicago.
- 500 Tons, Chicago, Goldblatt Store, to American Bridge Co.
- 350 Tons, Philadelphia, warehouse for Penn Mutual Life Co., through Irwin & Leighton, Philadelphia, to Belmont Iron Works, New York.
- 340 Tons, Winnebago County, Ill., bridge section 75F, to Bethlehem Steel Co., Bethlehem, Pa.
- 330 Tons, Lemont, Ill., Argonne Laboratory building, to American Bridge Co.
- 280 Tons, New York, apartment house at Sedwich Avenue and Kingsbridge Rd., to Grand Iron Works.
- 274 Tons, Chester, Pa., paper machinery building, Scott Paper Co., to Frank M. Weaver, Lansdale, Pa.
- 270 Tons, Indianapolis, state fair grounds horse barn, to International Steel Co., Evansville, Ind.
- 200 Tons, East Boston, Mass., bus garage for Massachusetts Transportation Authority, Boston, at East Boston Airport, through Bossi Construction Co., Roxbury, Mass., to West End Iron Works, Cambridge, Mass.
- 120 Tons, Needham, Mass., elementary school, through Vara Construction Co., Inc., Brookline, Mass., to West End Iron Works, Cambridge, Mass.
- 104 Tons, Wilkes-Barre, Pa., Wilkes College gym, to Ostrander Machine Works.

Fabricated steel inquiries this week included the following:

- 5000 Tons, Allegheny County, Pa., Pennsylvania Turnpike Commission, bridge superstructure, Section 31a and 31b, due Mar. 29.
- 4600 Tons, Washington County, Pa., State Highway & Bridge Authority, superstructure for Belle Vernon bridge, due Mar. 31.
- 3500 Tons, Beaver County, Pa., Pennsylvania Turnpike Commission, bridge, Section 29c and 29d, due Mar. 20.
- 1170 Tons, Erie County, Pa., bridge, Pennsylvania Dept. of Highways, due Mar. 31.
- 1169 Tons, Erie County, Pa., construction of 3 reinforced concrete structures, 2 I-beam bridges, 1 reinforced concrete bridge, State Highway & Bridge Authority, Harrisburg, Pa. Bids to March 21.
- 820 Tons, New Orleans, La., XX Falstaff Brewery building, bids due Mar. 10.
- 500 Tons, Grand Forks, N. D., gymnasium and field house.
- 315 Tons, Grays Harbor Co., Wash., steel bridge, approaches, etc., State Highway 9 (Humpulps River and overflow bridges), Director of Highways, Olympia, bids to Mar. 21.
- 150 Tons, Stearns County, Minn., bridge No. 6460.
- 140 Tons, Benton County, Minn., bridge No. 6590.
- 120 Tons, Butler Co., Pa., reconstruction steel and concrete bridge over Connoquenessing Creek, Secretary of Highways, Harrisburg, Pa., bids to 11:00 a.m. March 24, 1950.
- 115 Tons, Sussex County, Del., Charles W. Cullen bridge, Delaware Dept. of Highways, due Mar. 15.

Reinforcing bar awards this week included the following:

- 1200 Tons, Lancaster County, Pa., Pennsylvania Turnpike section, to Jones and Laughlin Steel Corp., Pittsburgh.
- 325 Tons, Chicago, 860 Lake Shore Drive, apartment building, to U. S. Steel Supply Co., Chicago.
- 160 Tons, Chicago, medical center steam plant, to Concrete Steel Co., New York.

Reinforcing bar inquiries this week included the following:

- 1500 Tons, Chicago, 4950 Marine Drive, apartment building.
- 1196 Tons, Waltham and Weston, Mass., Route 128, bituminous concrete bituminous macadam, tar treated gravel and 12 bridges, F. D. Sabin, Cambridge, district engineer. Completion date June 30, 1951.
- 470 Tons, Erie County, Pa. Construction of 3 reinforced concrete structures, 2 I-beam bridges, 1 reinforced concrete bridge, State Highway & Bridge Authority, Harrisburg, Pa. Bids to March 31.
- 239 Tons, Reading and Wakefield, Mass., bituminous concrete and bituminous macadam and five bridges, Route 12. F. D. Sabin, Cambridge, district engineer. Completion date June 30, 1951.
- 225 Tons, Minneapolis, bridge for Great Northern Railway.
- 200 Tons, St. Joseph, Mich. Berrien County building.
- 120 Tons, Butler Co., Pa., reconstruction steel and concrete bridge over Connoquenessing Creek, Secretary of Highways, Harrisburg, Pa., bids to 11:00 a.m. March 24, 1950.
- 110 Tons, Farmington, Calif., Farmington dam and spillway, Sacramento Dist., Corps of Engineers, CIVENG 04-167-50-21, bids to Apr. 13.
- 108 Tons, Grays Harbor Co., Wash., bridge, approaches, etc., State Highway 9, (Humpulps River and overflow bridges), Director of Highways, Olympia, bids to Mar. 21.

Steel piling awards this week included the following:

- 2500 Tons, Hackensack, N. J., piers for Hackensack River bridge, New Jersey Turnpike Authority, Section 7(6), through R. B. Jaggard Engineering Co., Westmont, N. J., to Bethlehem Steel Co., Bethlehem.

Steel pipe inquiries this week included the following:

- 117 Tons, San Francisco, steel pipe, San Francisco District Corps of Engineers, Serial ENG-04-203-50-156, bids to Mar. 22.

Steel plate inquiries this week included the following:

- 1000 Tons, New Haven, Conn., tank, Atlantic Refining Co., due Mar. 7.

Steel sheet inquiries this week included the following:

- 148 Tons, Waltham and Weston, Mass., Route 128, bituminous concrete and macadam and 12 bridges.

Railroad awards this week included the following:

- 50,000 Tons, to Tennessee Coal, Iron & Railroad Co., Birmingham, from Atlantic Coast Line Railroad Co.

Ore Pier Contracts Awarded

Baltimore—Contracts for the construction of a new \$5 million import ore pier in Baltimore harbor have been awarded by the Baltimore and Ohio R.R., sponsors of the project.

Construction work will be done by Empire Construction Co. of Baltimore while the contract for dredging the channel adjacent to the pier has been given to the Arundel Corp. of Baltimore.

The new pier, designed for the handling of bulk import ores, including iron, manganese and chrome, will be completed in 1951. It is the first facility of this type to be built by any Eastern Seaboard railroad.

Bethlehem Moves Erection Unit

San Francisco—Erection department headquarters of the Bethlehem Pacific Fabricated Steel Construction Div. will be moved on April 1 from Los Angeles to Alameda, Calif. The new location will be the now idle Alameda yard of the Bethlehem Shipbuilding Div.

The new location will more nearly centralize steel erection headquarters with respect to the location of the company's fabricating plants. A new fabricating

plant in Seattle is expected to be in operation on May 1 at which time Bethlehem Pacific will have four steel fabricating plants located at Seattle, South San Francisco, Alameda and Los Angeles.

Mystic River Bridge Opened

Boston—The largest bridge in New England, the new Mystic River structure containing 30,000 tons of structural steel opened here recently. Steel for the bridge was fabricated according to specifications of the supervising engineers J. E. Grenier Co. of Baltimore, at Elmira, N. Y., Ambridge, Pa., and Trenton, N. J.

American Bridge Co. and Bethlehem Steel Co. shared in supplying the steel. The bridge cost \$27,000,000 to build and will give work to 75 persons.

UAW Loses Representation Fight

Chicago—The Farm Equipment Div. of United Electrical Workers defeated the United Automobile Workers in a close vote at the International Harvester Co. The farm equipment union and the UEW are units recently expelled by the CIO which have merged. The UAW had challenged the farm equipment group's right to represent Harvester workers.

MARKET

IRON AGE
FOUNDED 1855
MARKETS & PRICES

Briefs and Bulletins

coal strike aftermath—It will probably take three weeks for Jones & Laughlin Steel Corp. to recover from the effects of the coal strike. The company's Pittsburgh and Aliquippa, Pa., plants were shut down, and resumption of operations will be slow due to the fact that production processes from coke making on up the line must be started up on a progressive basis. The J&L plants had been down tight since the week before last. Wheeling Steel Corp. started up two blast furnaces, increased coke production from 38 to 75 pct of capacity and resumed operation of a skelp mill, pipe welding mill, converter mill and blooming mill this week.

pressure—End of the coal strike hasn't solved steel problems in the Midwest. Strike or no, demand for most steel products exceeds the capacity of this area. Steel lost during the strike has only made it worse. Mills report that pressure for shipments on all products seems just as great today as it was before the coal settlement. Moreover, they can't see the possibility of making up lost tonnage in the foreseeable future. Even at capacity, they will have to allocate all products.

battle for business—The stage is pretty well set for a battle for business between the railroads and the truckers. Just when the truckers were about ready to raise their rates, the railroads announced that they would request lower rates on some iron and steel items. This move is partly aimed at recapturing some of the shipments into Detroit, where deliveries by truck have been increasing daily. The truckers could retaliate by forgetting about their projected rate increase.

close shave—The coal agreement came as a relief to the canners who had been worried about their tinplate supply. If the tinplate situation had gotten much worse, canners would have been scraping the bottom of the barrel during the sanitary container production peak next July. This is a critical period for tinplate production because the container manufacturers are now taking in all they can get for the preliminary steps of manufacture.

swedish competition—Swedish charcoal pig iron is now being offered in Philadelphia at a price of \$67.50 c.i.f. Atlantic Ports. This reduced price places the Swedish product in direct competition with domestic charcoal iron.

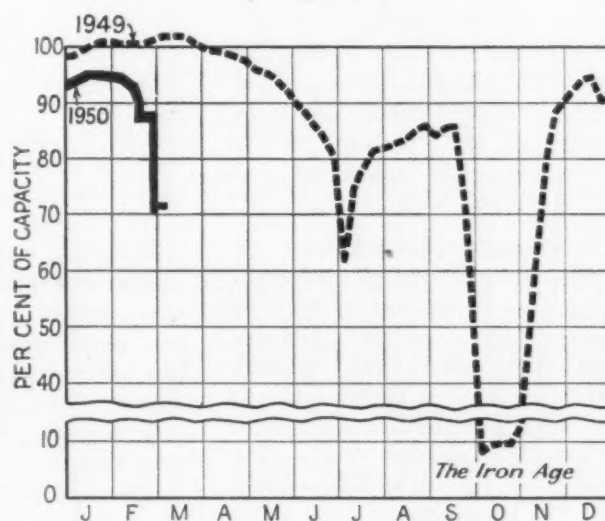
weirton pensions—An amended pension program calling for one-third increase in retirement income benefits for Weirton Steel Co.'s 13,000 employees and salaried workers of other National Steel Corp. subsidiaries, with no increase in cost to employees, has been announced. All members of the plan will be guaranteed \$100.00 per month including social security, in addition to any benefits purchased by the employee's contribution. The amended plan was effective as of Jan. 1.

continued shutdown—Tennessee, Coal, Iron & R.R. Co. doesn't expect to have any of its openhearth back on at Ensley this week, despite the end of the coal strike. Five to six out of ten openhearth will be on at Fairfield. Republic with only one of four blast furnaces in production expects to get 85 pct of rated capacity out of seven of its eight open hearths.

electrical sheets—To meet competition the Allegheny Ludlum Steel Corp. has reduced the price of electrical grade sheets \$5 per ton.

blown out—The No. 2 blast furnace of the Edgar Thomson Works, Carnegie-Illinois Steel Corp., was blown out Feb. 25 for relining.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
February 28.....	58.5*	87.5*	58.0*	60.0*	95.0*	96.0	89.5	58.0	100.0*	71.5	73.0	88.9	98.6	73.0*
March 5.....	65.0	84.5	59.0	70.0	98.0	98.5	89.5	43.0	101.0	53.0	71.0	84.4	98.6	73.0

* Revised.

Nonferrous METALS OUTLOOK

Market Activities

Strong world tin market sends heavy orders to RFC . . .
Traders fear sustained loss of tin business . . . End of coal
strike strengthens metals markets.

by

John Anthony



New York—The Reconstruction Finance Corp. took orders early this week for a heavy tonnage of tin at its price of 74½¢, the first time since December that the agency did any real volume of business. The ending of the coal strike brought buyers into the market, many of them calling for immediate delivery. But there was very little tin business done by importers and traders, whose price for prompt shipment was ⅛¢ above the RFC price.

RFC Competes With Trade

This situation brings into prominent view a market picture of major concern to the tin trade here. The government, through RFC, has been in active competition with private business. Ever since the reopening of the free market in tin in mid-November, RFC has been following the world price down, getting very little business in competition with the more flexible position of traders. But now that there has been a strengthening of the world tin price, reflected in higher prices on the Singapore market, the traders are in no position to meet the government price.

	Mar. 1	Mar. 2	Mar. 3	Mar. 4	Mar. 6	Mar. 7
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	74.50	74.50	74.50	74.50	74.50	74.50
Zinc, East St. Louis	9.75	9.75	9.75	9.75	9.75	9.75
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

So the tin trade cannot be expected to take any appreciable amount of business until weakness sets in again on the world market or the RFC raises its price. RFC ended the year with about 22,000 long tons of tin in inventory, ample with production by the government smelter to meet the current rate of domestic demand. Unless the world market continues to climb, RFC would be reluctant to raise its price due to the need to move its inventory. Tin buyers would be more critical of a government price increase than of an open market rise.

Strike End Aids Metal Demand

The end of the coal strike has proved a boon to the metal markets which had been slowing down recently. Early this week it was too soon to sense a major trend

developing. But any prospect of price reductions in zinc or copper is very dim. There is a much better prospect of a price advance in one or perhaps both of these metals, should consumers now operating on minimum inventories rush in to buy. This is quite possible now that the major industry strikes have been settled and it can be seen that their net effect has been to extend the period for an optimistic outlook for heavy industry.

The lead market is the softest spot in the picture. The industry has been pretty heavily dependent on government buying.

The price of antimony was cut 2¾¢ per lb to a price of 24½¢ at Laredo, Tex., last week. But foreign metal was offered shortly afterward at several cents below the new domestic price.

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb. f.o.b. shipping point, freight allowed)
Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 76S-O, 76S-OAL, 36.3¢; 0.081 in., 2S, 28, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 76S-O, 76S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 76S-O, 76S-OAL, 47.6¢.
Plate: ¼ in., and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 76S-F, 76S-FAL, 33.9¢.
Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25, 36.7¢ to 1.05; 35 to 37, 44¢ to 1.53; 47 to 49, 68.5¢ to 32.20.
Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.
Screw Machine Stock: Rounds, 11S-T3, R317-T4; ¼ to 11/32 in., 49¢ to 38¢; ¼ to 1½ in., 37.5¢ to 35.5¢; 1 9/16 to 3 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.
Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 66S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 64¢; 76S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb. f.o.b. mill, freight allowed)
Sheets and Plate: Ma, FSA, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, 1.12-1.31; 24, 1.62-1.75. Specification grade higher. Base: 30,000 lb.
Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 48¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ¼ in. diam., 10,000 lb; ¼ in. to 1½ in., 20,000 lb; 1½ in. and larger, 30,000 lb.
Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher. Base: Up to ¼ in. diam., 10,000 lb; ¼ in. to 1½ in., 20,000 lb; 1½ in. and larger, 30,000 lb.
Extruded Solid Shapes, Rectangle: M, in weight per ft. for perimeters of less than size indicated, 0.10 to 0.11 lb per ft. per. up to 3.5 in., 55¢ 0.22 to 0.25 lb per ft. per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft. per. up to 8.9 in., 47¢; 1.8 to 2.59 lb per ft. per. up to 19.5 in., 44¢; 4 to 6 lb per ft. per. up to 28 in., 45¢. Other alloys higher. Base, in weight per ft. of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.
Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.087, ¼ to 5/16, 11.14; 6/16 to ¾, 11.02; ¾ to 1, 7.65; 1 to 2 in., 6.5¢; 0.085 to 0.082, ¾ to 7/16, 8.5¢; ¾ to 1, 6.3¢; 1 to 2 in., 57¢; 0.165 to 0.319, ¾ to 1, 8.4¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in. in. Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb. f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	40	

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18		31.78
Copper, h-r	28.03		
Copper, drawn	29.28		
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	
Red brass	30.60	30.29	33.51*
Naval brass	32.51	27.57	28.82
Lead brass		23.19	27.22
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	30.92	32.42
Phosphor bronze	50.90	51.15	
Muntz metal	31.58	27.14	28.39
Everdur, Hercu-loy, Olym-pic, etc.	37.19	36.14	
Nickel silver, 10 pct	39.66	41.87	46.80
Arch. bronze			27.22
*Seamless tubing.			

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	24.50
Beryllium copper, 1.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Bismuth, ton lots	\$2.00
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Iridium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, 100 to 5000 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask	
f.o.b. New York	\$70 to \$73
Nickel, electro, f.o.b. New York	42.97
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$66 to \$69
Silver, New York, cents per oz.	73.25
Tin, New York	74.50
Zinc, East St. Louis	9.75
Zinc, New York	10.47
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	16.75-18.25
No. 120	16.25-17.75
No. 123	15.75-17.25
80-10-10 ingot	
No. 305	21.75
No. 315	19.75
88-10-2 ingot	
No. 210	27.75
No. 215	25.25
No. 245	18.25-21.00
Yellow ingot	
No. 405	14.25-16.00
Manganese bronze	
No. 421	20.75

Aluminum Ingot

(Cents per lb, lot of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.50-19.00
0.60 copper, max.	18.25-18.75
Piston alloys (No. 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	16.25-16.75
108 alloy	16.75-17.25
195 alloy	17.50-18.00
13 alloy	18.50-19.00
AXS-679	16.75-17.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 ½%	17.75-18.50
Grade 2—92-95%	16.75-17.50
Grade 3—90-92%	16.75-16.50
Grade 4—85-90%	15.25-15.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35 ½
Electrodeposited	29 ¾
Rolled, oval, straight, delivered	33
Ball anodes	33 ¾
Brass, 30-20	
Cast, oval, 15 in. or longer	31 ½
Zinc, oval, 99.88%, f.o.b. Detroit	17 ½
Ball anodes	16 ½
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46 ½
Copper sulfate, 99.5 crystals, bbl.	11.10
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz lots, per oz	59
Sodium cyanide, 96 pct domestic	
200 lb drums	19.25
Zinc sulfate, 89 pct granular	11.00
Zinc cyanide, 100 lb drums	38.00

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turn-ings
Copper	15 ½	14 ½
Yellow brass	12 ½	11 ½
Red brass	14	13 ½
Commercial bronze	14 ½	13 ½
Manganese bronze	12	11 ½
Leaded brass rod ends	12 ½	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	15.25
No. 2 copper wire	14.25
Light copper	13.25
Refinery brass	13.50*
Radiators	9.75
*Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	15.25
No. 2 copper wire	14.25
Light copper	13.25
No. 1 composition	12.25
No. 1 comp. turnings	11.75
Rolled brass	10.50
Brass pipe	11.00
Radiators	10.00
Heavy yellow brass	9.75

Aluminum	
Mixed old cast	9.25- 9.50
Mixed old clips	9.25- 9.50
Mixed turnings, dry	7.00- 7.50
Pots and pans	9.25- 9.50
Low copper	11.50-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	13 ½-14
No. 2 heavy copper and wire	12 ½-13
Light copper	11 ½-11 ¾
Auto radiators (unsweated)	8 ½- 8 ¾
No. 1 composition	11-11 ½
No. 1 composition turnings	10 ½-10 ¾
Clean red car boxes	9- 9 ½
Cocks and faucets	9- 9 ½
Mixed heavy yellow brass	7 ½- 7 ¾
Old rolled brass	8 ½- 8 ¾
Brass pipe	9 ½- 9 ¾
New soft brass clippings	10 ½-11
Brass rod ends	9 ½-10
No. 1 brass rod turnings	9 ½- 9 ¾

Aluminum

Alum. pistons and struts	4 ½- 5
Aluminum crankcases	7- 7 ½
2S aluminum clippings	10 ½-11
Old sheet and utensils	7- 7 ½
Borings and turnings	4
Misc. cast aluminum	7- 7 ½
Dural clips (24S)	7- 7 ½

Zinc

New zinc clippings	6 ½- 7
Old zinc	4- 4 ½
Zinc routings	2 ½- 3
Old die cast scrap	3 ½- 3 ¾

Nickel and Monel

Pure nickel clippings	21-23
Clean nickel turnings	14-15
Nickel anodes	20-22
Nickel rod ends	20-22
New Monel clippings	12-14
Clean Monel turnings	8- 9
Old sheet Monel	10-12
Old Monel castings	9-10
Inconel clippings	11-13
Nickel silver clippings, mixed	8-10
Nickel silver turnings, mixed	6- 7

Lead

Soft scrap, lead	9 ½- 9 ¾
Battery plates (dry)	4 ½- 4 ¾

Magnesium

Segregated solids	9-10
Castings	5 ½- 6 ½

Miscellaneous

Block tin	60-62
No. 1 pewter	38-40
No. 1 auto babbitt	35-37
Mixed common babbitt	9- 9 ¾
Solder joints	11 ½-12
Siphon tops	40-42
Small foundry type	11 ½-12
Monotype	10 ½-11
Lino. and stereotype	9 ½-10 ½
Electrotype	8 ½- 8 ¾
New type shell cuttings	11 ½-11 ¾
Hand picked type shells	4- 4 ½
Lino. and stereo. dross	4 ½- 5
Electro. dross	2 ½- 3

MARKETS—PRICES—TRENDS



SCRAP

Iron & Steel

Shoveling Turnings Pace Reviving Market

The hottest item early this week was shoveling turnings, on which prices increased by as much as \$1.50 per ton. In Chicago they were up 50¢ a ton; in Philadelphia the advance was \$1.00; while in New York and Boston this grade was bid up \$1.50 a ton by brokers.

The reason of course was anxiety of blast furnace men to bring iron output back up as fast as possible by sweetening up the charge. The bigger increases in the East are believed to reflect willingness to reach out to get turning tonnages in a hurry.

Not enough time has elapsed to reflect the end of the coal strike in scrap prices. Brokers are expecting a very active market as soon as operations return to normal. They hope the mills will not be as hesitant in buying as they were during the strike. However, no great price increases are expected in the near future.

The main reason no very sharp price advances or runaway market are expected is the behavior

of the market earlier this year. Prices now are not far from their January levels, when the steel industry was operating at better than 90 pct of rated capacity. While similar high levels are expected soon, steel companies will apparently continue to buy quietly so prices will not move up sharply.

PITTSBURGH—The market was strengthened here as a result of the coal strike settlement. No. 1 heavy melting was up \$1 to \$32 on the basis of a sale late last week at that figure, plus the fact that brokers were paying as much as \$31.50 to fill an old order at \$31. Dealers and some consumers agreed that settlement of the coal strike has brought strength to this area.

CHICAGO—The market here remains quiet and the trade does not expect any immediate pickup in activity as a result of the coal settlement. Among the mills which did not have to curtail operations, one large purchaser has made March commitments for heavy melting steel at no change in prices. Foundry grades continue as the strongest items in the market.

PHILADELPHIA—There was a small amount of new business in melting grades placed at previously quoted prices. Shoveling turnings advanced \$1.00 on renewed buying by a local consumer. Malleable

business was placed at a higher price, raising quotations by \$2.00. The foundry strike here continues, although settlement had been expected last week. This development may be expected to weaken cast.

NEW YORK—Cast grades firmed up here during the latter part of last week, with price increases in all grades. Heavy demand for shoveling turnings during the coal strike caused the price to rise \$1.50 to a high of \$13.00 per ton. It is still too early for prices to adequately reflect the coal strike settlement.

DETROIT—The local scrap market is still hung over as a result of the coal strike and there are indications that the lethargy prevailing here for the past month or more will continue. Local observers who had anticipated a short reawakening of interest in scrap with the settlement of the coal strike have not seen these hopes realized.

CLEVELAND—A strong undertone marked the scrap market here and in the Valley this week, needing only purchase of a representative tonnage by a major consumer to start it on an upward price spiral. Mill inventories are down somewhat, but at present mills had not increased shippers' schedules. Blast furnace grades are very strong. Closing of the railroad lists has also spurred talk of higher prices, with one major road getting an average of \$32.75 for No. 1 heavy melting. Foundry grades are strong.

ST. LOUIS—Buying for outside interests strengthened the market for standard steel car axles and malleable, and prices are \$1 a ton higher in the St. Louis market. Heavy breakable cast moved up \$1 as a result of the strength of demand from steel mills. Outside of a cut back of hot metal by the district pig iron producer, the coal strike had little effect on operations here. Railroad lists: St. Louis-Southwestern, 1,000 tons and Missouri-Pacific 1,400 tons.

BOSTON—There was a little more activity here this week and a generally brighter tone. Nothing strenuous but enough to lift prices a little. No. 1 steel and bundles were up 50¢ a ton and turnings were stronger. No. 2 steel did not move. Cast is still rather dull but No. 2 machinery moved \$1 a ton higher.

BUFFALO—End of the coal strike bolstered sentiment in the scrap basket, but the stalemate in steel making grades continued as leading consumers remained on the sidelines. Dealers expressed the opinion that new business would be placed shortly within prevailing ranges. However, it was admitted that the approach of spring with increased collections might have a bearish effect on prices.

CINCINNATI—A stronger undertone prevailed in the scrap market here this week. Blast furnace grades are active, turnings are movable, and No. 1 heavy melting is in active demand at quoted prices. Foundry grades are moving in small tonnages.

BIRMINGHAM—Buying of openhearth grades remains light in a market that shows no noticeable change in trend. With pig iron production yet to recover fully from the coal strike, demand is strong for cast grades.

How to Turn a Mountain Inside Out



Photographed in West Virginia Coal Fields by William Vandivert

In a very real sense, the engineers shown here have to know the innermost secrets of a mountain, for it's their job to decide just how the coal locked deep in its heart can most economically and efficiently be mined. Indeed, the blocks they've laid out on a proposed mine plan represent thousands of tons of coal—and the strips, the conveyors that will move it out to the modern surface preparation plant fast.

Today's progressive mines are planned for years ahead by mining engineers. Through advance surveys, they "engineer" around the "faults" in coal seam formation, plan transport, ventilation and pumping systems, design entries and haulage ways. But that's only the "underground" part of their job. For besides the expense of opening a mine, coal producers must also provide million-dollar preparation plants and all railroad, power and other facilities that go with them. Only because of development work and capital expenditures, however, are America's coal mines the most productive, efficient and safest to work for in the world.

Today many coal buyers order coal "made" to their own special standards. They specify various qualities such as grade, and the amount of carbon, volatile ash and sulphur content. Some even require that coal be treated with special oils to aid combustion. Modern mines—thanks to million-dollar preparation plants—are able to supply users with coals custom-designed to increase the efficiency and performance of even older boilers. Often these prepared coals make it possible for the user to produce more needed steam, heat or power without expanding or replacing existing combustion equipment.

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WASHINGTON, D. C.

There can be no true security for the American worker, no steady progress for American industry, no sure protection for the American public, as long as UNION MONOPOLY can dictate when a man shall work and when industry shall produce.

March 9, 1950

Pittsburgh

No. 1 hvy. melting	\$31.50 to \$32.00
No. 2 hvy. melting	28.50 to 29.00
No. 1 bundles	31.50 to 32.00
No. 2 bundles	23.50 to 24.00
Machine shop turn.	22.00 to 22.50
Mixed bor. and ms. turns	22.00 to 22.50
Shoveling turnings	24.50 to 25.00
Cast iron borings	24.50 to 25.00
Low phos. plate	33.50 to 34.00
Heavy turnings	27.00 to 28.00
No. 1 RR. hvy. melting	33.00 to 33.50
Scrap rails, random lgth.	35.50 to 36.50
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	35.50 to 36.00
RR. spring steel	35.50 to 36.00
RR. couplers and knuckles	35.50 to 36.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	31.00 to 32.00
Malleable	33.00 to 34.00

Chicago

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	25.00 to 26.50
No. 2 dealers' bundles	23.00 to 24.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.50 to 21.50
Cast iron borings	20.00 to 21.00
Low phos. forge crops	32.00 to 33.00
Low phos. plate	30.50 to 31.50
No. 1 RR. hvy. melting	29.00 to 30.00
Scrap rails, random lgth.	33.00 to 34.00
Rerolling rails	41.00 to 42.00
Rails 2 ft and under	39.00 to 40.00
Locomotive tires, cut	34.00 to 35.00
Cut bolsters & side frames	31.00 to 32.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	42.00 to 43.00
RR. couplers and knuckles	32.00 to 33.00
No. 1 machinery cast.	39.00 to 40.00
No. 1 agricul. cast.	37.00 to 38.00
Heavy breakable cast.	30.00 to 31.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	38.00 to 39.00

Philadelphia

No. 1 hvy. melting	\$22.50 to \$23.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	22.50 to 23.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	15.00 to 16.50
Mixed bor. and turn.	14.00 to 14.50
Shoveling turnings	18.00 to 18.50
Low phos. punchings, plate	25.50 to 26.00
Low phos. 5 ft and under	24.50 to 25.00
Low phos. bundles	24.50 to 25.00
Hvy. axle forge turn.	22.50 to 23.50
Clean cast chem. borings	28.00 to 29.00
RR. steel wheels	28.00 to 29.00
RR. spring steel	28.00 to 29.00
Rails 18 in. and under	35.00 to 36.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	30.00 to 31.00
Heavy breakable cast.	33.00 to 34.00
Cast iron car wheels	35.00 to 36.00
Malleable	36.00 to 37.00

Cleveland

No. 1 hvy. melting	\$28.00 to \$28.50
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	28.00 to 28.50
No. 1 bundles	28.00 to 28.50
No. 2 bundles	22.50 to 23.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	20.50 to 21.00
Cast iron borings	20.50 to 21.00
Low phos. 2 ft and under	29.00 to 29.50
Steel axle turn.	27.00 to 27.50
Drop forge flashings	28.00 to 28.50
No. 1 RR. hvy. melting	32.00 to 32.50
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast.	42.00 to 43.00
RR. cast.	42.00 to 43.00
RR. grate bars	30.00 to 31.00
Stove plate	34.00 to 35.00
Malleable	38.00 to 39.00

Youngstown

No. 1 hvy. melting	\$31.50 to \$32.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	31.50 to 32.00

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$24.50 to \$25.00
Machine shop turn.	21.00 to 21.50
Shoveling turnings	23.00 to 23.50
Cast iron borings	23.00 to 23.50
Low phos. plate	32.50 to 33.00

Buffalo

No. 1 hvy. melting	\$27.50 to \$28.00
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	25.50 to 26.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	24.00 to 24.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	29.00 to 29.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	35.00 to 36.00
No. 1 cupola cast.	30.50 to 31.50
Stove plate	30.00 to 31.00
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	23.00
Machine shop turn.	\$16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	27.00 to 28.00
Structural and plate	27.00 to 28.00
No. 1 RR. hvy. melt.	26.00 to 27.00
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	33.00 to 34.50
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	33.50 to 34.50
Std. steel axles	28.00 to 29.00
No. 1 cupola cast.	35.00 to 36.00
Stove plate	30.00 to 31.00
Cast iron car wheels	28.00 to 29.00

St. Louis

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 bundled sheets	24.00 to 25.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	18.00 to 19.00
Rails, random lengths	30.00 to 31.00
Rails 3 ft and under	35.00 to 36.00
Locomotive tires, uncut	27.00 to 28.00
Angles and splice bars	34.00 to 35.00
Std. steel car axles	40.00 to 42.00
RR. spring steel	30.00 to 31.00
No. 1 machinery cast.	37.00 to 38.00
Hvy. breakable cast.	31.00 to 32.00
Cast iron brake shoes	29.00 to 30.00
Stove plate	28.00 to 29.00
Cast iron car wheels	35.00 to 36.00
Malleable	32.00 to 33.00

New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$20.50 to \$21.00
No. 2 hvy. melting	17.50 to 18.00
No. 2 bundles	15.50 to 16.50
Machine shop turn.	10.75 to 11.25
Mixed bor. and turn.	10.50 to 11.00
Shoveling turnings	12.50 to 13.00
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	27.00 to 28.00
Mixed yard cast.	26.00 to 26.50
Charging box cast.	25.00 to 26.00
Heavy breakable cast.	25.00 to 26.00
Unstrp. motor blocks	19.50 to 20.00

Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$20.00 to \$20.50
No. 2 hvy. melting	16.50 to 17.00
No. 1 bundles	20.00 to 20.50

No. 2 bundles	\$15.00 to \$15.50
Machine shop turn.	11.00 to 11.50
Mixed bor. and turn.	11.00 to 11.50
Shoveling turnings	13.00 to 14.00
No. 1 busheling	17.00 to 17.50
Clean cast chem. borings	18.00 to 18.50
No. 1 machinery cast.	25.50 to 26.50
No. 2 machinery cast.	22.00 to 23.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	20.00 to 21.00

Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	22.00 to 23.00
New busheling	21.00 to 22.00
Flashings	21.00 to 22.00
Machine shop turn.	14.50 to 15.00
Mixed bor. and turn.	14.50 to 15.00
Shoveling turnings	15.50 to 16.50
Cast iron borings	15.50 to 16.50
Low phos. plate	22.00 to 23.00
No. 1 cupola cast.	33.00 to 34.00
Heavy breakable cast.	26.00 to 27.00
Stove plate	27.00 to 28.00
Automotive cast.	35.00 to 36.00

Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$26.50 to \$27.00
No. 2 hvy. melting	22.50 to 23.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	22.50 to 23.00
Machine shop turn.	14.50 to 15.00
Mixed bor. and turn.	15.50 to 16.00
Shoveling turnings	16.50 to 17.00
Cast iron borings	16.50 to 17.00
Low phos. 18 in. under	33.00 to 33.50
Rails, random lengths	34.00 to 34.50
Rails, 18 in. and under	42.00 to 43.00
No. 1 cupola cast.	35.00 to 36.00
Hvy. breakable cast	33.00 to 34.00
Drop broken cast	42.00 to 43.00

San Francisco

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	28.00
No. 1 RR. hvy. melting	20.00
Scrap rails, random lgth.	20.00
No. 1 cupola cast.	\$30.00 to 35.00

Los Angeles

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Mach. shop turn.	9.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	\$32.50 to 35.00

Seattle

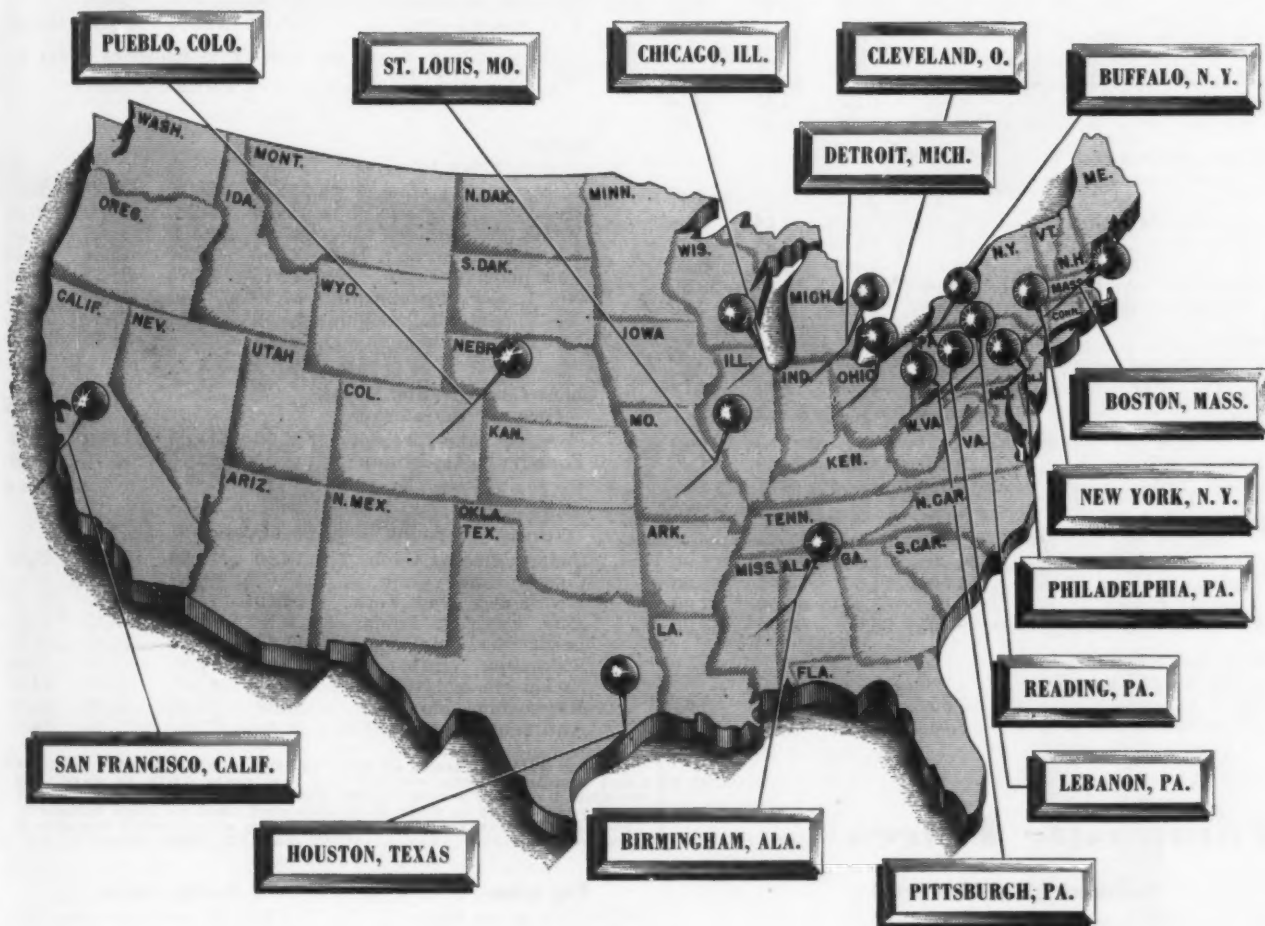
No. 1 hvy. melting	\$18.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Elec. fur. 1 ft and under	\$25.00 to 28.00
RR. hvy. melting	19.00
No. 1 cupola cast.	30.00
Heavy breakable cast.	20.00

Hamilton, Ont.

No. 1 hvy. melting	\$24.00
No. 1 bundles	16.00
No. 2 bundles	16.00
Mechanical bundles	22.00
Mixed steel scrap	20.00
Mixed bor. and turn.	18.00
Rails, remelting	24.00
Rails, rerolling	27.00
Bushelings	18.50
Bush., new fact, prep'd.	22.00
Bush., new fact, unprep'd.	17.00
Short steel turnings	18.00
Cast scrap	\$40.00 to 43.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

March 9, 1950

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Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Mar. 7, 1950	Feb. 28, 1950	Feb. 7, 1950	Mar. 8, 1949
(cents per pound)	1950	1950	1950	1949
Hot-rolled sheets	3.35	3.35	3.35	3.26
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.21	4.21	4.21	4.063
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25

Tin and Terneplate:

(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.50	\$7.50	\$7.50	\$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65

Bars and Shapes:

(cents per pound)				
Merchant bars	3.45	3.45	3.45	3.37
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:

(cents per pound)				
Bright wire	4.50	4.50	4.50	4.194

Rails:

(dollars per 100 lb)				
Heavy rails	\$3.40	\$3.40	\$3.40	\$3.20
Light rails	3.75	3.75	3.75	3.55

Semifinished Steel:

(dollars per net ton)				
Rerolling billets	\$54.00	\$54.00	\$54.00	\$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00

Wire Rod and Skelp:

(cents per pound)				
Wire rods	3.85	3.85	3.85	3.619
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:

(per gross ton)	Mar. 7, 1950	Feb. 28, 1950	Feb. 7, 1950	Mar. 8, 1949
No. 2, foundry, Phila.	\$50.42	\$50.42	\$50.42	\$51.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti.	49.08	49.08	49.08	49.46
No. 2, Birmingham	42.38	42.38	42.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	50.76
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	168.60

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.

Scrap:

(per gross tons)				
Heavy melt'g steel, P'gh.	\$31.75	\$30.75	\$31.25	\$36.75
Heavy melt'g steel, Phila.	23.00	23.00	23.00	37.50
Heavy melt'g steel, Ch'go	27.50	27.50	27.50	34.50
No. 1 hy. com. sh't, Det.	22.50	22.50	23.50	33.00
Low phos. Young'n.	32.75	32.75	31.75	41.50
No. 1, cast, Pittsburgh	37.50	37.50	37.50	45.50
No. 1, cast, Philadelphia	35.50	35.50	37.00	42.00
No. 1, cast, Chicago	39.50	39.50	38.50	41.50

Coke: Connellsville:

(per net ton at oven)				
Furnace coke, prompt	\$14.00	\$14.00	\$14.00	\$15.25
Foundry coke, prompt	15.75	15.75	15.75	16.50

Nonferrous Metals:

(cents per pound to large buyers)				
Copper, electro, Conn.	18.50	18.50	18.50	23.50
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	74.50	74.50	74.50	\$1.03
Zinc, East St. Louis	9.75	9.75	9.75	17.50
Lead, St. Louis	11.80	11.80	11.80	21.30
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.93
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	24.50	27.25	27.25	38.50

[Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)]

Composite Prices

Finished Steel Base Price

Mar. 7, 1950	3.837¢ per lb.
One week ago	3.837¢ per lb.
One month ago	3.837¢ per lb.
One year ago	3.754¢ per lb.

	High	Low
1950....	3.837¢ Jan. 3	3.837¢ Jan. 3
1949....	3.837¢ Dec. 27	3.705¢ May 3
1948....	3.721¢ July 27	3.193¢ Jan. 1
1947....	3.193¢ July 29	2.848¢ Jan. 1
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1
1945....	2.464¢ May 29	2.396¢ Jan. 1
1944....	2.396¢	2.396¢
1943....	2.396¢	2.396¢
1942....	2.396¢	2.396¢
1941....	2.396¢	2.396¢
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939....	2.35367¢ Jan. 3	2.26689¢ May 16
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935....	2.07642¢ Oct. 1	2.06492¢ Jan. 8
1932....	1.89196¢ July 5	1.83910¢ Mar. 1
1929....	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron

.....\$46.38 per gross ton....
..... 46.38 per gross ton....
..... 46.38 per gross ton....
..... 46.74 per gross ton....

High			Low		
\$46.38	Feb.	7	\$45.88	Jan.	3
46.87	Jan.	18	45.88	Sept.	6
46.91	Oct.	12	39.58	Jan.	6
37.98	Dec.	30	30.14	Jan.	7
30.14	Dec.	10	25.37	Jan.	1
25.37	Oct.	23	23.61	Jan.	2
\$23.61			\$23.61		
23.61			23.61		
23.61			23.61		
\$23.61	Mar.	20	\$23.45	Jan.	2
23.45	Dec.	23	22.61	Jan.	2
22.61	Sept.	19	20.61	Sept.	12
23.25	June	21	19.61	July	6
23.25	Mar.	9	20.25	Feb.	16
19.74	Nov.	24	18.73	Aug.	11
18.84	Nov.	5	17.83	May	14
14.81	Jan.	5	13.56	Dec.	6
18.71	May	14	18.21	Dec.	17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel

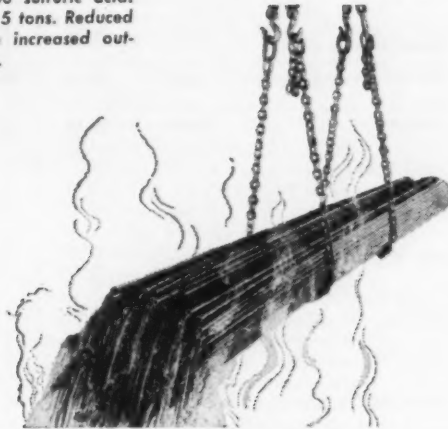
.....\$27.42 per gross ton....
..... 27.08 per gross ton....
..... 27.25 per gross ton....
..... 36.25 per gross ton....

High			Low		
\$27.42	Feb.	21	\$26.25	Jan.	3
43.00	Jan.	4	19.33	June	28
43.16	July	27	39.75	Mar.	9
42.58	Oct.	28	29.50	May	20
31.17	Dec.	24	19.17	Jan.	1
19.17	Jan.	2	18.92	May	22
19.17	Jan.	11	15.76	Oct.	24
\$19.17			\$19.17		
19.17			19.17		
\$22.00	Jan.	7	\$19.17	Apr.	10
21.83	Dec.	30	16.04	Apr.	9
22.50	Oct.	3	14.08	May	16
15.00	Nov.	22	11.00	June	7
21.92	Mar.	30	12.67	June	9
17.75	Dec.	21	12.67	June	8
13.42	Dec.	10	10.33	Apr.	29
8.50	Jan.	12	6.43	July	5
17.58	Jan.	29	14.08	Dec.	8

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.



Former chains on these mechanical picklers used to fail in 2½ months. Monel chains are giving 1½ years' service 24 hours a day in hot, 10% sulfuric acid. Average load is 5 tons. Reduced shut-downs have increased output substantially.



Monel sling chains handling 4 to 5 tons of steel tubing. 75 such chains are in this plant. Where 1¼" chains of another metal failed in 9 months, these Monel chains have already served 6 years.

The Life is longer The Weight is less The Metal is Monel

Monel® Pickling Chain—like any piece of Monel pickling equipment—pays for itself.

Any pickling-room foreman or superintendent who has used Monel will tell you that.

For he knows that Monel's superior resistance to corrosion by hot pickling acids and fumes means longer life and greater safety.

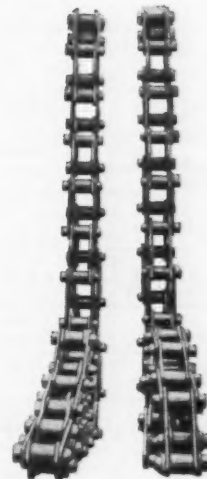
He knows, too, that the higher strength of Monel makes it possible to use *lighter* chain that saves up to 20% in dead weight.

"PICK MONEL" for all types of pickling equipment. In addition to chain, you can have "Monel protection" for crates, baskets, racks, hairpin hooks, tie-rods, nuts, washers, and other items. For more information on Monel and Monel fabricators, write to our Ray Reddell.

Monel link chain is formed from hot-rolled rod, and welded. The welds retain all the strength and all the corrosion resistance of the parent metal.

Regular Monel chain ranges in size from ¼" to 1¼". In addition, special types of sprocket chain, as well as a complete line of accessories such as hooks, lifting links, U-bolts and open links are available.

Whether you are using chain as slings or in mechanical picklers, you'll get the maximum in safety, long life and light weight, if you make that chain *Monel!*



Mechanical pickler chains made of Monel for use in the pickling of steel pipe prior to galvanizing. Chains are so designed to permit quick and easy replacement of any individual part.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.



Monel
PICKLING
EQUIPMENT

extra life
extra capacity
extra safety

March 9, 1950

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IRON AGE STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit
INGOTS														
Carbon forging, net ton	\$50.00 1													\$50.00 31
Alloy, net ton	\$51.00 1-17													\$51.00 31
BILLETS, BLOOMS, SLABS														
Carbon, rerolling, net ton	\$53.00 1	\$53.00 1	\$53.00 1				\$57.00 13		\$53.00 3	\$58.00 28	\$53.00 3			
Carbon forging billets, net ton	\$63.00 1	\$63.00 1-4	\$63.00 1-8	\$63.00 4			\$63.00 25		\$63.00 3-4	\$65.00 28	\$63.00 3			\$63.00 31
Alloy, net ton	\$66.00 1-17	\$66.00 1-4	\$66.00 1		\$66.00 4-42		\$66.00 18	\$66.00 3	\$66.00 3-4	\$68.00 26	\$66.00 3			\$66.00 31
SHEET BARS							\$57.00 13							
PIPE SKELP	3.15 1						3.15 1-4							
WIRE RODS	3.85 2-18	3.85 2-4-23	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS														
Hot-rolled (18 ga. & hvr.)	3.35 1-5-9-15	3.35 28	3.35 1-6-8	3.35 4-6			3.35 1-4-6-13		3.35 3	3.45 26		3.35 3		3.55 12
Cold-rolled	4.10 ¹⁻⁵ 7-9-16-68		4.10 1-6-8	4.10 4-13		4.10 7	4.10 4-6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1-9-15		4.40 1-8		4.40 4		4.65 ⁴⁻⁴ 4.75 ⁴⁻⁴					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1-8	4.40 4		4.40 7	4.40 ⁶ 4.90 ⁷⁻⁶						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9-15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1-5-9	5.05 1	5.05 1-6-8	5.05 4-6			5.05 1-4-6-13		5.05 3	5.05 26		5.05 3		5.25 12
Hi Str. low alloy, c.r.	6.20 1-5-9		6.20 1-6-8	6.20 4-6			6.20 4-6-13		6.20 3			6.20 3		6.40 12
Hi Str. low alloy, galv.	6.75 1											6.75 3		
STRIP														
Hot-rolled (over 6 in.)	3.25 5-7-9-25	3.25 8-66	3.25 1-6-8	3.25 5			3.25 1-4-6-13		3.25 3	3.35 26		3.25 3		3.45 12-47
Cold-rolled	4.15 5-7-9-63	4.30 8-66	4.30 8	4.15 2-6		4.15 7	4.15 4-6-13-40-48-69		4.15 3			4.15 3	4.40 ⁴⁻⁴¹ 4.35 ¹²⁻⁴⁷	
Hi Str. low alloy, h.r.	4.95 9		4.95 1-6-8	4.95 5			4.95 1-4-6-13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2-6			6.20 4-6-13		6.20 3			6.20 3		6.40 12
TINPLATE														
Cokes, 1.50-lb base box 1.25 lb, deduct 20¢	\$7.50 1-5-9-15		\$7.50 1-6-8				\$7.50 4					\$7.60 3	\$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage														
Hollowware enameling	5.30 1-5-15		5.30 1-6				5.30 4					5.40 3	5.50 22	
BARS														
Carbon steel	3.45 1-5-9-17	3.45 1-4-22	3.45 1-6-8	3.45 4	3.45 4		3.45 1-4-6		3.45 3-4		3.45 3			3.65 12
Reinforcing?	3.45 1-5	3.45 4	3.45 1-6-8	3.45 4			3.45 1-4-6		3.45 3-4		3.45 3	3.45 3		
Cold-finished	4.10 ⁵ 4.15 ²⁻⁴ 17-52-69-71	4.15 ² 23-69-70	4.15 4-73-74	4.15 2-61	4.15 4-32-92		4.15 6-40-57		4.15 70					4.35 ¹² 4.30 ⁴
Alloy, hot-rolled	3.95 1-17	3.95 1-4-22	3.95 1-6-8		3.95 4		3.95 1-6-25	3.95 3	3.95 3-4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2-17-52-69-71	4.90 2-23-69-70	4.90 4-73-74	4.90 3-61	4.90 4-32-92		4.90 6-25-57	4.90 3	4.90 3-70					5.05 ⁴
Hi Str. low alloy, h.r.	5.20 1-5		5.20 1-6-8	5.20 4			5.20 1-6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE														
Carbon Steel	3.50 1-5	3.50 1	3.50 1-6-8	3.50 4			3.50 1-13		3.50 3	3.60 25	3.50 3	3.50 3		3.75 12
Floor plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 24	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1-5	5.35 1	5.35 1-2	5.35 4-5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural														
Hi Str. low alloy	3.40 1-5-9	3.40 1-23	3.40 1-6-8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1-5	5.15 1	5.15 1-6-8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURERS' WIRE														
Bright	4.50 2-5-18	4.50 ² 4-12-33-34		4.50 2-77			4.50 6	Kokomo=4.60 ²⁰			4.50 3	4.60 3	Duluth=4.50 ² Pueblo=4.75 ⁴	
PILING, Steel sheet	4.20 ¹⁻⁹ 1	4.20 1							4.20 3					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana	
	\$68.00 ⁸³			INGOTS Carbon forging, net ton
		\$53.00 ¹¹	F=\$72.00 ¹⁹	Alloy, net ton
	\$71.00 ⁸⁴	\$63.00 ¹¹	F=\$82.00 ¹⁹	BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	\$74.00 ⁸⁵		F=\$85.00 ¹⁹	Carbon forging billets, net ton
				Alloy, net ton
			Portsmouth=\$55.00 ²⁰	SHEET BARS
				PIPE SKELP
4.25 ⁸⁶	3.85 ¹¹	SF=4.50 ²⁴ LA=4.65 ^{24, 62}	Portsmouth=3.85 ²⁰ Worcester=4.15 ²	WIRE RODS
	3.35 ^{4, 11}	SF, LA=4.05 ²⁴ F=4.25 ¹⁹	Ashland ⁷ =3.35 Niles=3.50 ⁶⁴	SHEETS Hot-rolled (18 ga. & hvr.)
	4.10 ¹¹	SF=5.05 ²⁴ F=5.00 ¹⁹		Cold-rolled
	4.40 ^{4, 11}	SF, LA=5.15 ²⁴	Ashland ⁷ =4.40 ⁷ Kokomo=4.50 ¹⁰	Galvanized (10 gage)
				Enameling (12 gage)
				Long ternes (10 gage)
	5.05 ¹¹	F=6.74 ¹⁹		Hi Str. low alloy, h.r.
		F=7.05 ¹⁹		Hi Str. low alloy, c.r.
				Hi Str. low alloy, galv.
3.85 ⁸⁷	3.85 ⁸⁸	3.25 ¹¹	SF, LA=4.00 ^{24, 62} F=4.40 ¹⁹ S=4.25 ⁶²	STRIP Hot-rolled
			F=5.40 ¹⁹ LA=5.50 ²⁷	Cold-rolled
	4.95 ¹¹	F=6.64 ¹⁹	Ashland=3.25 ⁷ Atlanta=3.40 ⁶⁵	Hi Str. low alloy, h.r.
		F=6.95 ¹⁹	New Haven=4.65 ^{2, 64}	*Hi Str. low alloy, c.r.
	7.60 ¹¹	SF=8.25 ²⁴		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price				Electrolytic 0.25, 0.50, 0.75 lb box
				BLACKPLATE, 29 gage Hollowware enameling
4.05 ⁸⁹	3.85 ⁸⁸	3.45 ^{4, 11}	SF, LA=4.15 ²⁴ LA=4.15 ⁶²	BARS Carbon steel
4.05 ⁸⁹	3.85 ⁸⁸	3.45 ^{4, 11}	SF, S=4.20 ⁶² F=4.10 ¹⁹	Reinforcing [‡]
			Putnam, Newark=4.55 ⁶⁹	Cold-finished
4.55 ⁹⁰	4.35 ⁸⁹		LA=5.00 ⁶² F=4.95 ¹⁹	Alloy, hot-rolled
			Newark, ⁶⁹ Worcester ² =5.20 Hartford=5.20 ⁴	Alloy, cold-drawn
		5.20	F=6.25 ¹⁹	Hi Str. low alloy, h.r.
	3.90 ⁸⁹	3.90 ^{4, 11}	F=4.10 ¹⁹ S=4.40 ⁶² Geneva=3.50 ¹⁶	PLATE Carbon steel
			Claymont=3.60 ²⁹ Coatesville=3.60 ²¹ Harriburg=3.50 ³⁵	Floor plates
			Harriburg=4.55 ³⁵	Alloy
			F=5.40 ¹⁹	Hi Str. low alloy
		5.35 ¹¹	F=5.95 ¹⁹	SHAPES, Structural
4.00 ⁹¹	3.80 ⁸⁹	3.40 ¹¹	SF=3.95 ⁶² LA=4.00 ^{24, 62}	Hi Str. low alloy
		5.15 ¹¹	F=4.00 ¹⁹ S=4.05 ⁶²	MANUFACTURERS' WIRE Bright
5.10 ⁹²	4.90 ⁸⁹	4.50 ^{4, 11}	SF, LA=5.45 ^{24, 62}	
			Portsmouth=4.50 ²⁰ Worcester=4.80 ¹	

Notes: †Special coated mfg ternes, deduct \$1.00 from 1.50-lb coke base box price.
Can-making quality blackplate, 55 to 128-lb, deduct \$1.90 from 1.50-lb coke base box.
‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

- Carnegie-Illinois Steel Corp., Pittsburgh
- American Steel & Wire Co., Cleveland
- Bethlehem Steel Co., Bethlehem
- Republic Steel Corp., Cleveland
- Jones & Laughlin Steel Corp., Pittsburgh
- Youngstown Sheet & Tube Co., Youngstown
- Armco Steel Corp., Middletown, Ohio
- Inland Steel Co., Chicago
- Weirton Steel Co., Weirton, W. Va.
- National Tube Co., Pittsburgh
- Tennessee Coal, Iron & R. R. Co., Birmingham
- Great Lakes Steel Corp., Detroit
- Sharon Steel Corp., Sharon, Pa.
- Colorado Fuel & Iron Corp., Denver
- Wheeling Steel Corp., Wheeling, W. Va.
- Geneva Steel Co., Salt Lake City
- Crucible Steel Co. of America, New York
- Pittsburgh Steel Co., Pittsburgh
- Kaiser Co., Inc., Oakland, Calif.
- Portsmouth Steel Corp., Portsmouth, Ohio
- Lukens Steel Co., Coatesville, Pa.
- Granite City Steel Co., Granite City, Ill.
- Wisconsin Steel Co., South Chicago, Ill.
- Columbia Steel Co., San Francisco
- Copperweld Steel Co., Glassport, Pa.
- Alan Wood Steel Co., Conshohocken, Pa.
- Calif. Cold Rolled Steel Corp., Los Angeles
- Allegheny Ludlum Steel Corp., Pittsburgh
- Worth Steel Co., Claymont, Del.
- Continental Steel Corp., Kokomo, Ind.
- Rotary Electric Steel Co., Detroit
- Laclede Steel Co., St. Louis
- Northwestern Steel & Wire Co., Sterling, Ill.
- Keystone Steel & Wire Co., Peoria, Ill.
- Central Iron & Steel Co., Harrisburg, Pa.
- Carpenter Steel Co., Reading, Pa.
- Eastern Stainless Steel Corp., Baltimore
- Washington Steel Corp., Washington, Pa.
- Jessop Steel Co., Washington, Pa.
- Blair Strip Steel Co., New Castle, Pa.
- Superior Steel Corp., Carnegie, Pa.
- Timken Steel & Tube Div., Canton, Ohio
- Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- Reeves Steel & Mfg. Co., Dover, Ohio
- John A. Roebling's Sons Co., Trenton, N. J.
- Simonds Saw & Steel Co., Fitchburg, Mass.
- McLouth Steel Corp., Detroit
- Cold Metal Products Co., Youngstown
- Thomas Steel Co., Warren, Ohio
- Wilson Steel & Wire Co., Chicago
- Sweet's Steel Co., Williamsport, Pa.
- Superior Drawn Steel Co., Monaca, Pa.
- Tremont Nail Co., Wareham, Mass.
- Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
- Ingersoll Steel Div., Chicago
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- Fitzsimmons Steel Co., Youngstown
- Stanley Works, New Britain, Conn.
- Universal-Cyclops Steel Corp., Bridgeville, Pa.
- American Cladmetals Co., Carnegie, Pa.
- Cuyahoga Steel & Wire Co., Cleveland
- Bethlehem Pacific Coast Steel Corp., San Francisco
- Follansbee Steel Corp., Pittsburgh
- Niles Rolling Mill Co., Niles, Ohio
- Atlantic Steel Co., Atlanta
- Acme Steel Co., Chicago
- Jaslyn Mfg. & Supply Co., Chicago
- Detroit Steel Corp., Detroit
- Wyckoff Steel Co., Pittsburgh
- Bliss & Laughlin, Inc., Harvey, Ill.
- Columbia Steel & Shaffing Co., Pittsburgh
- Cumberland Steel Co., Cumberland, Md.
- La Salle Steel Co., Chicago
- Monarch Steel Co., Inc., Indianapolis
- Empire Steel Co., Mansfield, Ohio
- Mahoning Valley Steel Co., Niles, Ohio
- Oliver Iron & Steel Co., Pittsburgh
- Pittsburgh Screw & Bolt Co., Pittsburgh
- Standard Forgings Corp., Chicago
- Driver Harris Co., Harrison, N. J.
- Detroit Tube & Steel Div., Detroit
- Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- Sheffield Steel Corp., Kansas City
- Plymouth Steel Co., Detroit

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	106 125½
Woven wire fence	116 139
Fence posts, carloads†	116
Single loop bale ties	113 137
Galvanized barbed wire**	126 146
Twisted barbed wire	126 146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per Pittsburg, 100 lb	Calif.
Merch. wire, annealed†	\$5.35	\$6.30
Merch. wire, galv.†	5.60	6.55
Cut nails, carloads††	6.75	

† Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
†† Less 20¢ to jobbers.
‡ Torrance, 126.

PRODUCING POINTS — Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Alliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburgh, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.
Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.
Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. (21)	*25.60	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)	*22.50	
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	27.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-		
stainless, Carnegie, Pa. (60)	75.00	
Aluminized steel sheets, hot		
dip, Butler, Pa. (7)	7.75	

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	†6.45
Electrical	††6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; add 0.25¢; Granite City, Ill., 22; add 20¢; Indiana Harbor, Ind., 8; deduct 0.25¢; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 17; deduct 0.25¢; Warren, Ohio, 4; Zanesville, Ohio, 77; deduct 0.25¢.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List	Less Case C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & 5/8 in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. & shorter	26	37
All diam., longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	23	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

½ in. and smaller	25	37
9/16 to ¾ in.	23	35
¾ to 1½ in. inclusive	23	35
1½ in. and larger	16	29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List	Reg	Hvy	Lt
½ in. and smaller	41	35	41	
9/16 to ¾ in.	36	30	36	
¾ to 1½ in.	31	27	33	
1½ in. and larger	21	17		

In full case lots, 15 pct additional discount.

Stove Bolts

	Pct Off List
Packaged, steel, plain finish	63
Packaged, plated finish	50
Bulk, plain finish**	69*

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	\$7.25

Small Rivets

(7/16 in. and smaller)

	Pct Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	43

Cap and Set Screws

	Pct Off List
(In bulk)	
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ¾ in. x 6 in., SAE 1020, bright	60
¾ in. through ¾ in. x 6 in. and shorter high C heat treated	54
Milled studs	28
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43
Set screws, sq head, cup point, 1 in., diam and smaller x 6 in. and shorter	59

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢
Worcester, add 0.30¢.	

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	\$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70
After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.	

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	\$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Tie plates, Pittsburgh, Torr., Calif.*	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

* Seattle, add 30¢.

† Kansas City, 5.85¢.

PRODUCING POINTS—Standard rails, Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

	W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	—	\$1.00
18	4	1	—	5	—	\$1.565
18	4	2	—	—	—	\$1.12
1.5	4	1.5	8	—	—	71.5¢
6	4	2	6	—	—	70.5¢
High-carbon-chromium						57.5¢
Oil hardened manganese						32¢
Special carbon						29.5¢
Extra carbon						24.5¢
Regular carbon						21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4¼¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	\$13.50 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$15.50 to \$16.00
Foundry, oven coke	
Buffalo, del'd	\$20.90
Chicago, f.o.b.	21.00
Detroit, f.o.b.	20.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Painesville, Ohio, f.o.b.	21.90
Erie, del'd	\$21.04 to 21.25
Cleveland, del'd	22.62
Cincinnati, del'd	22.71
St. Paul, f.o.b.	23.50
St. Louis, del'd	21.60
Birmingham, del'd	19.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net; Effective CaF₂ content:

70% or more	\$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound,
f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingot, re-rolling.....	12.75	13.50	15.00	14.80	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, re-rolling.....	17.00	18.25	20.25	19.25	30.25	24.50	28.75	15.80	18.50	15.25
Forg. discs, die blocks, rings.....	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging.....	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50	26.50
Sheets.....	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	33.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngtown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES

(F.o.b. works)

Fire Clay Brick

Carloads, Per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5).....\$86.00
No. 1 Ohio.....80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 80.00
No. 2 Ohio.....72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50).....14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.\$86.00
Childs, Pa.90.00
Hays, Pa.91.00
Chicago District95.00
Western, Utah and Calif.101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)15.00
Silica cement, net ton, bulk, Hays, Pa.17.00
Silica cement, net ton, bulk, Ensley, Ala.16.00
Silica cement, net ton, bulk, Chicago District16.00
Silica cement, net ton, bulk, Utah and Calif.22.50

Chrome Brick

Per Net Ton

Standard chemically bonded, balt., Chester\$69.00

Magnesite Brick

Standard, Baltimore\$91.00
Chemically bonded, Baltimore80.00

Grain Magnesite

St. %-in. grains

Domestic, f.o.b. Baltimore, in bulk, fines removed...\$56.00 to \$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines.....30.50 to 31.00
in sacks with fines.....35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢...\$12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.
Swedish sponge iron c.i.f. New York, ocean bags... 7.4¢ to 9.0¢

Domestic sponge iron, 98+%	
Fe, carload lots.....	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe.....	31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe.....	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe.....	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micros, 98%, 99.8+% Fe.....	90.0¢ to \$1.75
Aluminum.....	29.00¢
Antimony.....	42.53¢
Brass, 10 ton lots.....	23.25¢ to 26.75¢
Copper, electrolytic.....	28.625¢
Copper, reduced.....	28.50¢
Cadmium.....	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead.....	18.50¢
Manganese.....	55.00¢
Molybdenum, 99%.....	\$2.65
Nickel, unannealed.....	61.00¢
Nickel, spherical, minus 30 mesh, unannealed.....	68.00¢
Silicon.....	34.00¢
Solder powder.....	8.5¢ plus metal cost
Stainless steel, 302.....	75.00
Tin.....	86.50¢
Tungsten, 99%.....	\$2.90
Zinc, 10 ton lots.....	15.50¢ to 18.25¢

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
CARBON		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about \$200.00 per net ton

Standard, T & C

Steel, butt-weld*	Black	Galv
½-in.	40 ½ to 38 ½	24 to 22
¾-in.	43 ½ to 41 ½	28 to 26
1-in.	46 to 44	31 to 29
1 ¼-in.	46 ½ to 44 ½	31 ½ to 29 ½
1 ½-in.	47 to 45	32 to 30
2-in.	47 ½ to 45 ½	32 ½ to 30 ½
2 ½ to 3-in.	48 to 46	33 to 31

Steel, lap-weld		
2-in.	37	23 ½ to 22 ½
2 ½ to 3-in.	41 to 40	25 ½ to 24 ½
3 ½ to 6-in.	44 to 40	28 ½ to 24 ½

Steel, seamless		
2-in.	36	20 ½
2 ½ to 3-in.	39	23 ½
3 ½ to 6-in.	41	25 ½

Wrought iron, butt-weld		
½-in.	+26 ½	+53
¾-in.	+16 ½	+42
1 & 1 ¼-in.	+10 ½	+33
1 ½-in.	+4 ½	+29 ½
2-in.	+4	+29

Wrought iron, lap-weld		
2-in.	+13 ½	+37
2 ½ to 3 ½-in.	+11	+32 ½
4-in.	+6	+26 ½
4 ½ to 8-in.	+8	+28
9 to 12-in.	+18	+37 ½

Extra Strong, Plain Ends

Steel, butt-weld		
½-in.	39 ½ to 37 ½	24 ½ to 22 ½
¾-in.	43 ½ to 41 ½	28 ½ to 26 ½
1-in.	45 ½ to 43 ½	31 ½ to 29 ½
1 ¼-in.	46 to 44	32 to 30
1 ½-in.	46 ½ to 44 ½	32 ½ to 30 ½
2-in.	47 to 45	33 to 32
2 ½ to 3-in.	47 ½ to 45 ½	33 ½ to 31 ½

Steel, lap-weld		
2-in.	37 to 36	22 ½ to 21 ½
2 ½ to 3-in.	42 to 40	27 ½ to 25 ½
3 ½ to 6-in.	45 ½ to 41 ½	41 to 29

Steel, seamless		
2-in.	35	20 ½
2 ½ to 3-in.	39	24 ½
3 ½ to 6-in.	42 ½	28

Wrought iron, butt-weld		
½-in.	+22	+47
¾-in.	+15 ½	+40
1 to 2-in.	+5 ½	+29

Wrought iron, lap-weld		
2-in.	+10 ½	+33 ½
2 ½ to 4-in.	+1	+22
4 ½ to 6-in.	+5	+26 ½
7 & 8-in.	list	+21 ½
9 to 12-in.	+11 ½	+29 ½

For threads only, butt-weld, lap-weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt-weld, lap-weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap-weld and seamless 3 ½-in. and larger four points higher discount (lower price) applies. On butt-weld and lap-weld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD gage in in.	Seamless H.R.	Electric Weld H.R.	C.D.
2 13	\$20.61	\$24.24	\$19.99
2 ½ 12	27.71	32.58	26.88
3 12	30.82	36.27	29.90
3 ½ 11	38.52	45.38	37.36
4 10	47.82	56.25	46.39

CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago...\$91.80 to \$95.30
6 to 24-in., del'd N. Y.... 91.00 to 92.00
6 to 24-in., Birmingham... 78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less\$108.50 to \$113.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20c to base price except Birmingham,
Cincinnati, Los Angeles, New Orleans and Philadelphia (*), add 15c).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.05	6.24- 6.44 ¹	6.46- 6.46 ²	5.59- 5.59 ¹¹	....	5.20- 5.64 ¹¹	5.49	5.49- 5.49 ¹¹	6.19	....	10.05	....	....
Birmingham*	5.05 ¹⁰	5.80	6.15 ²	5.10 ¹⁰	....	5.20	5.05	5.00 ¹⁰	6.73	....	....	....	....
Boston	5.73	6.48 ²⁰	6.79	5.78	6.90- 6.95	5.88	5.55	5.60	6.02- 6.58	9.70- 9.97	6.50- 10.37	11.15	11.43
Buffalo	5.05	5.80	6.63	5.41	7.27	5.45	5.15	5.05	5.75	9.80	9.90	11.05	11.33
Chicago	5.05	5.80	6.70	5.10	5.45- 6.16	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32- 5.97	5.80- 6.24	6.29- 6.39	5.49	....	5.59- 6.74	5.44- 5.59	5.39- 5.64	6.10- 6.25	9.60- 9.81	9.90- 10.11	11.05- 11.25	11.33- 11.58
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27- 6.58	5.89	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35- 10.45	10.50- 10.60	11.50	11.95- 12.10
Indianapolis	....	....	....	....	7.38	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.83	7.00	7.45 ²	5.85	7.35- 7.85 ¹⁴	5.80	5.70	5.80	7.55- 8.51	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	....	5.14	5.89	9.39	9.69	10.94	11.14
New Orleans*	5.50 ¹	6.85 ¹	....	5.55 ¹	6.90 ¹	5.65	5.55 ¹	5.55 ¹	6.75	....	....	....	....
New York	5.55- 5.65	6.54- 6.64	6.90- 7.00	5.84	6.75 ⁵	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Omaha	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.45	5.25	5.50	6.31	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.70	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60- 7.10 ¹	8.40 ²	8.20 ²	6.85 ²	....	6.50	6.45- 6.45 ²	8.60 ¹⁴	12.00 ¹⁸	11.60 ¹⁸	....	....	....
Salt Lake City	5.85	6.70	6.75	7.45	8.75	6.10 ³	5.90	7.39 ²	8.75	....	....	....	....
San Francisco	6.25 ¹¹	7.60 ²	7.50 ²	6.75 ¹¹	8.25	6.15 ¹¹	6.00	6.15 ¹¹	7.80	....	....	....	....
Seattle	6.70 ⁴	8.15 ²	8.20 ² - 8.35 ²	6.90 ⁴	....	35 ⁴	6.25 ⁴	6.35 ⁴	8.50 ¹⁴	....	11.60 ¹⁸	....	13.60 ¹⁸
St. Louis	5.38	6.13	7.03	5.43	6.68- 7.54	5.53	5.38	5.33- 5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.75	6.51	7.41	5.81	6.18- 6.62	5.91	5.75	5.71	6.42	9.96	10.26	11.41	11.71

BASE QUANTITIES: (Standard unless otherwise keyed on prices).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 9999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....	Boston	Everett	\$0.50 Arb.	.....	50.50	51.00	.....	60.90
Birmingham	41.88	42.38	.....	.....	.....	Boston	Steelton	6.90	.....	52.79	53.29	53.79	.....
Buffalo	46.00	46.50	47.00	.....	.....	Brooklyn	Bethlehem	4.29	.....	49.08	.....	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....	Cincinnati	Birmingham	6.70	48.58	51.13	51.63	52.13	.....
Cleveland	46.00	46.50	46.50	47.00	51.00	Jersey City	Bethlehem	2.63	.....	54.20	.....	.....	.....
Duluth	46.00	46.50	46.50	47.00	.....	Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Erie	46.00	46.50	46.50	47.00	.....	Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Everett	50.50	51.00	.....	.....	.....	Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Granite City	47.80	48.40	48.90	.....	.....	Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Ironton, Utah	46.00	46.50	.....	.....	.....	Philadelphia	Steelton	3.09	.....	49.13	49.63	.....	57.99
Pittsburgh	46.00	46.50	46.50	47.00	.....	Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
Geneva, Utah	46.00	46.50	.....	.....	.....	San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....	Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Steelton	48.00	48.50	49.00	49.50	54.00	St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Struthers, Ohio	46.00	.....	.....	.....	.....	Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....
Swedeland	46.00	48.50	49.00	49.50	.....							
Toledo	46.00	46.50	46.50	47.00	.....							
Troy, N. Y.	46.00	46.50	49.00	.....	54.00								
Youngstown	46.00	46.50	48.50	47.00	.....							

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese

content in excess of 1.00 pct. 82 per ton extra may be charged for 0.5 to 0.75 pct nickel content and 81 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct C/L per g.t., f.o.b. Jackson, Ohio—\$57.00; f.o.b. Buffalo, \$58.25. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$68.50. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

78-82% Mn, maximum contact base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etina, Clairton, Pa.	\$175
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerton, Pa.	\$64.00 \$65.00
Pgh. or Chicago	65.00 66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C	
7.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.55
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet.	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.	
25% Si	17.00
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	2.40 3.30 4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
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S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.95
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots.	
97% min. Cr, 1% max. Fe.	
0.20% max. C	\$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)	
Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.50¢ per lb of contained Si.	
Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.	

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

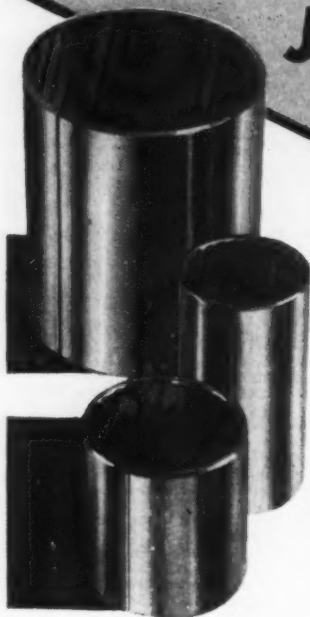
Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo	96¢
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	\$1.13
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti.	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	\$160.00
Ferrotungsten, standard, lump or ½ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovandium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdc oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Ton lots, packed, lump	11.75¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅	\$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢
Boron Agents	
Contract prices, per lb of alloy, del.	
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$4.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

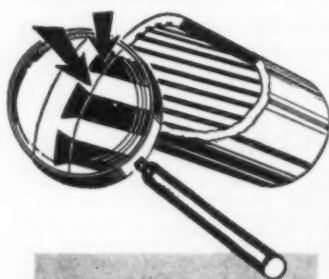
**On
hard-to-
lubricate
applications**

SPECIFY . .

JOHNSON GRAPHITED BEARINGS



BRONZE GRAPHITE



Graphite held permanently in place. Graphite area increases with wear. Not soluble in gasoline, oil or water.

YOU can eliminate bearing troubles on applications where lubrication is difficult or liable to be neglected. Johnson Graphited Bearings are designed for 40 to 45% graphite contact with the shaft, thus supplying constant free-running without further lubrication. In addition, Johnson Graphited Bearings are highly desirable where ordinary lubricants may damage food, textiles and other goods in process. They are widely used on conveyor rolls, immersion rolls in textile and paper industries, pumps handling corrosive liquids, and many other heavy-duty applications. Johnson Graphited Bearings are manufactured in cast bronze and sheet bronze. They are available in serrated and in plug types as illustrated. If you have such a troublesome bearing problem, write, wire or call for further information.

SELF LUBRICATING LEDALOYL

bearings, produced by powder metallurgy, are widely used for hard-to-lubricate applications where heavy-duty service is not an important factor. Johnson Bronze engineers will be glad to advise which type, Ledaloyl or Graphited, will best fit your requirements.

Johnson Bronze
SLEEVE BEARING HEADQUARTERS
505 S. MILL ST. NEW CASTLE, PA.

Iron Age *Introduces*

Continued from Page 23



PINCKNEY B. REED, manager of industrial equipment section, R C A Engineering Products Department.

Pinckney B. Reed has been named manager of the industrial equipment section of the R C A Engineering Products Department, replacing **George L. McKenna**, who recently became assistant to the vice president of the department.

R. L. Petersen was named to head the new southwest sales district of the Chemical Division of **KAISER ALUMINUM & CHEMICAL SALES, INC.** He will maintain headquarters in Houston. **J. T. Putnam**, who formerly headed the Pacific Northwest territory, will assume charge of the Los Angeles sales area. **R. M. Olive**, formerly superintendent of Permanente Cement Co.'s Diamond Division plant in Seattle, will head the Seattle district.

John L. Rose was appointed assistant director of public relations for the **FORD MOTOR CO.**, Dearborn. **Leggett Brown** was named News Bureau manager, a position held by Mr. Rose for two years. **Jack W. Clarke**, who has been regional public relations manager at Chicago for three years, has returned to Dearborn to take charge of Ford division public relations. **Kenneth Gregory** was named assistant to Mr. Brown.

John F. Agerter was appointed superintendent of blast furnaces at the Indiana Harbor works of the **YOUNGSTOWN SHEET & TUBE CO.** He succeeds **Clyde M. Horan**, who was transferred to Youngstown as superintendent of blast furnaces at the Campbell Works.

Paul T. Wharton, vice president of ROTARY ELECTRIC STEEL CO., Detroit, is retiring May 1. Mr. Wharton has been with Rotary in various capacities since the company was organized in 1933. He was elected vice president in 1947.

Pelton W. Ellis was named manager of the refining equipment division of PEABODY ENGINEERING CORP., New York. Previous to his employment with the company, Mr. Ellis spent several years as a sales engineer in South America.



JAMES D. ROLLINS, assistant chief engineer, Carnegie-Illinois Steel Corp.

James D. Rollins has been promoted to assistant chief engineer of CARNEGIE-ILLINOIS STEEL CORP., Pittsburgh. At the same time two other changes in engineering department personnel were made: Norman C. Michels has been appointed planning engineer to succeed Mr. Rollins and Harry C. Hunter was named contact engineer.

Herman Merker, executive vice president, PRESSED STEEL TANK CO., Milwaukee, has been named president by the company's Board of Directors, and assumes the duties of the late H. O. Brumder.

J. S. Morgan, engineer-in-charge of sales for the switchgear and control sections of ALLIS-CHALMERS' electrical department since 1947, has been named manager of the switchgear section.

Albert J. Berdis has been appointed assistant general superintendent of the Irvin Works of CARNEGIE-ILLINOIS STEEL CORP., Pittsburgh, and Albert T. Reichenbach succeeds him as superintendent of the Vandergrift plant of the company.

Turn to Page 124

SAVE! Time and Money PRODUCING...

ATMOSPHERE GAS

2 NEW COMPACT KEMP ATMOSPHERE GENERATORS OFFER PUSH BUTTON STARTING, FOOL-PROOF OPERATION

IF YOU need a compact source of atmosphere gas, save time and money, specify Kemp! Two new Kemp Atmosphere Generators (models MIHE-1 and 2) deliver 1000 and 2000 cfh respectively. Both offer all features of larger equipment: push button starting, automatic fire check, flow meter, etc. . . and assure that you get same analysis gas from 1% to 100% of capacity.

FOOL PROOF OPERATION

Kemp Generators burn ordinary gas just as it comes from the mains. A famous Kemp Carburetor, part of each installation, assures complete combustion without "tinkering" to produce

a clean, chemically inert gas containing 88% nitrogen, 12% CO₂ . . . a gas so pure it is used without further processing in copper annealing and in the manufacture of aspirin and laboratory chemicals, fine paints and a host of other products.

WRITE FOR DATA

Whether you need inerts for purging, fire protection, DX, blanketing or any steel application . . . specify Kemp. For technical information write for Bulletin 1-11. To find out how you can benefit: Tell us how you produce atmosphere gas now; we'll show you how Kemp can solve your problem. Mail Coupon today!

KEMP ATMOSPHERE GAS GENERATORS

OF BALTIMORE

CARBURETORS
BURNERS
FIRE CHECKS
ATMOSPHERE GENERATORS
ADSORPTIVE DRYERS
METAL MELTING UNITS
SINGING EQUIPMENT
SPECIAL EQUIPMENT

THE C. M. KEMP MFG. CO., Dept. C-3
405 E. Oliver St., Baltimore 2, Md.

Gentlemen: Send me information on Kemp Generators. I am interested in Bulletin 1-11; data on larger equipment.

Name
Company
Address
City Zone State

CORROSION

CHEMICAL RESISTANCE OF "KARBATE" PRODUCTS

The satisfactory use of "Karbate" brand impervious graphite is not limited to the chemical reagents, concentrations or fluid temperatures shown in this table.

CHEMICAL RESISTANCE									
The satisfactory use of "Karbate" brand impervious graphite in chemical reagents, concentrations or fluid temperatures shown in this table.									
Chemical Reagent	Concentration up to	Fluid Temperatures up to	Recommendation		Chemical Reagent	Concentration up to	Fluid Temperatures up to	Recommendation	
			Grade	Cement				Grade	Cement
ACIDS					HALOGENS, AIR, WATER cont.				
Acetic acid	All	Boiling	22	14	Steam	100%	340°F Boiling	22	14
Acetic anhydride	100%	Boiling	22	14	Water	100%	Boiling	22	14
Arsenic acid	All	Boiling	22	14	ORGANIC COMPOUNDS				
Boric acid	Saturated	Boiling	22	14	Acetone	100%	Boiling	22	14
Carbonic acid	Saturated	200°F	21	14	Amyl alcohol	100%	Boiling	22	14
Chromic trioxide, aq. soln.	10%	Room	(21)	14	Aniline	100%	Boiling	22	14
Chromium trioxide, aq. soln.	40%	200°F	22	14	Benzene	100%	Boiling	22	14
Citric acid	40%	Boiling	22	14	Butyl alcohol	100%	Boiling	22	14
Formic acid	All	Boiling	22	14	Butyl "Cellasolve"	100%	Boiling	21	8*
Hydrobromic acid	All	Boiling	22	14	Carbon tetrachloride	100%	257°F	22	14
Hydrochloric acid	48%	185°F	22	14	"Cellasolve"	100%	Boiling	22	14
Hydrofluoric acid	48-60%	—	22	14	Chloroethylbenzene	100%	340°F	22	14
Hydrofluoric acid	Over 60%	Boiling	22	14	Chloroform	100%	Boiling	22	14
Hydrofluoric acid	Saturated	Boiling	21	(14)	Dowtherm	100%	Boiling	22	14
Hydrogen sulphide-water	10%	185°F	21	(1)	Dioxan	95%	Boiling	22	14
Lactic acid	10-40%	140°F	21	x	Ethyl alcohol	100%	Boiling	22	14
Nitric acid	Over 40%	Boiling	22	14	Ethylene dichloride	Saturated	Room	22	14
Nitric acid	All	Boiling	22	14	Ethyl mercaptan-water	100%	Boiling	21	14
Oleic acid	All	Boiling	21	14	Freon 11 and 12	100%	340°F	22	14
Oxalic acid	85%	Boiling	22	14	Gasoline	100%	257°F	22	14
Phosphoric acid	All	Boiling	22	14	Glycerine	85%	Boiling	22	14
Stearic acid	75%	340°F	22	(1)	Hydrazine hydrate	100%	Boiling	22	14
Sulphuric acid	75-96%	—	22	x	Isopropyl acetate	100%	Boiling	22	14
Sulphuric acid	Over 96%	Boiling	22	14	Isopropyl alcohol	100%	Boiling	22	14
Tartaric acid	All	Boiling	21	15	Isopropyl ether	100%	Boiling	22	14
ALKALIES					Kerosene	All	Boiling	22	14
Ammonium hydroxide	All	Boiling	22	15	Mannitol	100%	Boiling	22	14
Monethanolamine	67%	Boiling	21	15	Methyl isobutyl ketone	100%	Boiling	22	14
Sodium hydroxide	67-80%	275°F	21	15	Methyl alcohol	100%	Boiling	22	8*
Sodium hydroxide	All	Boiling	21	8*	Monochlor benzene	100%	Boiling	22	14
Tetramine C	All	Boiling	22	14	Octyl alcohol	100%	Boiling	22	14
SALT SOLUTIONS					Paradichlorobenzene	100%	Boiling	22	14
Ammonium thiocyanate	100%	Boiling	22	14	Paraldehyde	100%	Boiling	22	14
Arsenic trichloride	All	230°F	22	x	Tetrachlorethane, sym.	100%	Boiling	21	14
Cupric chloride	All	Boiling	21	14	MIXTURES				
Ferric chloride	All	Boiling	22	14	Ammonium persulfate plus	25%	Room	22	8*
Ferrous chloride	All	Boiling	22	14	sulfuric acid	20%	Boiling	x	x
Ferrous sulphate	All	Boiling	22	14	Chlorinated ethyl alcohols	All	Boiling	22	14
Manganous sulphate	All	Boiling	22	14	Chrome plating solns.	20%	Boiling	21	14
Nickel chloride	All	Boiling	22	14	Hydrochloric acid	—	Boiling	22	14
Nickel sulphate	100%	Boiling	21	8	saturated with chlorine	—	Boiling	22	14
Phosphorus trichloride	All	Boiling	22	14	Levulinic acid plus	—	Boiling	22	14
Sodium chloride	25%	Boiling	22	14	angelico lactone	—	Boiling	22	14
Sodium hypochlorite	All	Boiling	22	14	Nickel plating solns.	All	Boiling	22	(1)
Stannic chloride	All	Boiling	22	14	(chloride)	15%	200°F	21	14
Zinc ammonium chloride	All	Boiling	22	14	Nickel plating solns.	5%	Boiling	22	14
Zinc chloride	27%	Boiling	22	14	(sulfate)	All	Boiling	21	8
Zinc sulfate	—	340°F	22	14	Nitric acid plus	—	Boiling	22	14
HALOGENS, AIR, WATER					hydrofluoric acid	—	Boiling	21	8
Air	100%	Room	22	14	Parkerizing solution	25%	Boiling	22	14
Bromine	Saturated	Room	22	14	Rayon Spin bath	—	Room	22	14
Bromine water	100%	Room	21	14	Sodium hypochlorite plus	—	Boiling	x	x
Chlorine—dry	Saturated	Room	x	x	sodium hydroxide	—	Boiling	x	x
Chlorine water	100%	Room	x	x	Sulfurous acid saturated	—	Boiling	x	x
Iodine	100%	Room	x	x	with sulfur dioxide	—	Boiling	x	x
Fluorine	100%	Room	x	x	Thionyl chloride plus	—	Room	x	x
					hydrochloric acid	96%	Room	x	x
					Sulfuric acid plus	.03%	Room	x	x
					nitric acid	—	Room	x	x

* For field assembly
x Not recommended.

"National" No. 15 cement is recommended.

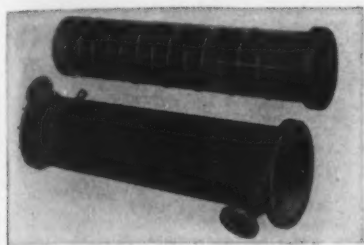
NOTES: (1) "National" No. 14 Cement used with threaded joints will give serviceable life of at least six months.

* For field assembly "National" No. 15 cement is recommended.
x Not recommended.

"National" carbon, graphite and "Karbate" impervious graphite are ideal for the construction of complete systems for the manufacture or handling of corrosive fluids. These products are both alkali-resistant and acid-resistant... immune to thermal shock... strong, light in weight... easily machined and fabricated. Graphite and "Karbate" impervious graphite have higher heat-conductivity than most commonly used corrosion-resistant materials. The following table gives complete information on the corrosion-resistance of "Karbate" materials.

and what to do about it—

Install carbon, graphite and "Karbate" impervious graphite equipment for storage, conveying, and processing of corrosive fluids



HEAT EXCHANGERS—

"Karbate" impervious graphite heat exchanger types include: shell and tube, cascade, plate, bayonet and concentric. Available in standard sizes or tailored to your specifications. Provide

excellent heat transfer. Resist acids and alkalis, immune to thermal shock, stand strain and vibration, light in weight, easy to install. Write for Catalog Section M-8808-A, describing Shell and Tube types; M-8804 and M-8809, describing Plate type and Bayonet type; and M-8807-C, describing the Cascade type.

PIPE AND FITTINGS—

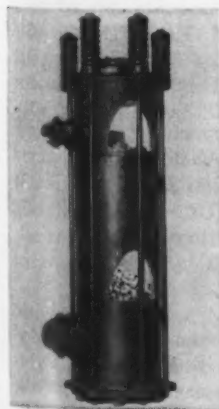
"Karbate" impervious graphite pipe and fittings in a complete size range include: elbows, crosses, couplings, caps, tees, plugs, nozzles, flanges, blind discs, collars, slotted couplers, flexible couplings.

Advantages: top corrosion resistance, immune to thermal shock, light weight, free from corrosion scale, good machinability, strong and not subject to fatigue. Write for Catalog Section M-8800B for ordering details on sizes, dimensions, grades. Catalog Section M-8801-A, the Installation Manual, tells you how to cut, serrate, cement, thread and support "Karbate" pipe. Also Catalog Sections M-9100-A on "Karbate" pumps and M-8803-A on globe valves.



TOWERS AND MISC. EQUIPMENT—

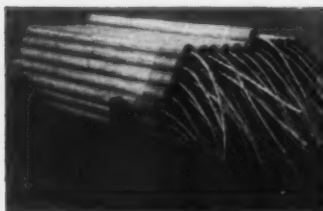
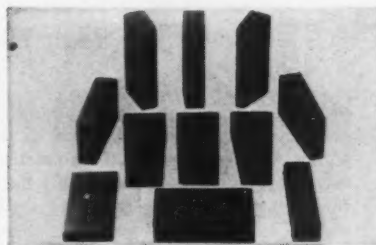
Towers made of "Karbate" impervious graphite provide low maintenance and long service life in absorption, fractionation, extraction, scrubbing and related processes. High structural strength, excellent resistance to corrosion and thermal shock, light weight. Bubble caps, trays and distributors made of carbon, graphite or "Karbate" impervious graphite for use in towers. Carbon Raschig rings for tower packing in a wide range of sizes. Write for Catalog Sections M-9600 and M-9601-A for information on HCl absorbers; M-9000-A for Raschig rings.



BRICK AND BLOCKS—

"National" carbon and graphite brick and blocks come in a complete range of sizes and shapes for such jobs as linings for stainless steel pickling tanks, sulphate digesters, caustic scrubbing

towers, starch hydrolysis equipment, phosphorus combustion chambers, phosphoric acid hydrators, sulphuric acid concentrators. Brick and blocks also used for blast furnace and run-out trough linings, where resistance to extreme heat and corrosion must be combined. All shapes are strong, immune to thermal shock, hold their shape at extremely high temperatures, are light in weight and easy to install. Write for Catalog Section M-8300-A for complete brick information.



GROUND ANODES—

"National" Graphite, Na graphite and carbon ground anodes, used in connection with "National" BF-2 backfill material, will greatly increase the life of any buried metallic structure subject to soil and

stray current corrosion. These anodes have been in service since 1924 and are tried and proved. Anodes are used to protect pipe lines, oil well casings, water mains, gas mains, refinery equipment, tank farms, underground cables, hot water tanks, chemical tanks, underwater structures, power plant equipment, barges, cooling tanks and coils, structural footings and many other similar items. Write for Catalog Sections M-8500-A.

Advantages of "Karbate" Impervious Graphite

- Resists the action of acids, alkalis and other chemicals
- High thermal conductivity
- Resistant to mechanical shock
- Immune to thermal shock
- Easy to machine and install
- Light in weight

The terms "Eveready", "National" and "Karbate" are registered trade-marks of

**NATIONAL CARBON
DIVISION**

**UNION CARBIDE AND
CARBON CORPORATION**
30 East 42nd Street
New York 17, N. Y.

DISTRICT SALES OFFICES:
Atlanta, Chicago, Dallas,
Kansas City, New York,
Pittsburgh, San Francisco

WRITE FOR COMPLETE INFORMATION AS OFFERED ABOVE!



So—We Sold Them the Pilot Model of Our New FT (100% Functional) Fork Truck Which Had Been in Their Plant on Test

● Put yourself in our place. Our engineers had been instructed to design a new 3000 to 4000 lb. capacity electric fork truck—a completely functional "work horse"—retaining traditional Baker quality and ruggedness and adding features that contribute to greater utility, safety and convenience.

For months they worked like demons—analyzing basic materials, testing controls, motor characteristics, hydraulic equipment, studying every essential truck function, designing, re-designing, assembling, re-assembling.

Finally they said—"HERE IT IS!"

"Looks like a lot of truck," said our management, "but how much will it cost?"

"LESS THAN ANY TRUCK IN ITS CLASS!" was the answer.

"Will it do the job?"

"LOOK AT THESE TEST RECORDS!"

Our engineers had subjected this truck to exhaustive tests covering every conceivable truck function. It had come through with flying colors.

BUT WE WANTED TO BE SURE!

So we selected a plant which had just about the toughest operating conditions you'll find anywhere . . . and put one of the pilot models on test there.

This plant is a high-production foundry. Abrasive dust, heavy, punishing loads, typical foundry floor conditions,

continuous, round-the-clock, three-shift operation—the most strenuous service you'll ever ask of a truck.

Frankly, no industrial truck had ever been able to "stand the gaff" in this foundry.

BUT THE BAKER FT DID!

From the day it was installed, there was **NOT ONE MINUTE OF DOWN TIME!**

As a result, the company insisted on keeping *this truck*; the pilot model which was in their plant on test!

That's the story of the development of the new Baker FT 3000 to 4000 lb. capacity Electric Fork Truck. Production models are now rolling off the assembly line in our new modern plant. Write us, or ask your nearest Baker representative to give you details on the toughest, lowest-priced, fork truck in its class.



Baker FT Fork Truck delivering rough castings to tumbling machine at the Taylor & Boggis Foundry.

THE BAKER INDUSTRIAL TRUCK DIVISION of The Baker-Raulang Co.

1227 WEST 80TH STREET • CLEVELAND 2, OHIO

In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

IRON AGE INTRODUCES

Continued from Page 121

Richard Aubrey has been named assistant to F. M. Rich, vice president in charge of operations for KAISER STEEL CORP.

J. W. Limbrock was made chief engineer of the PULLMAN CO., succeeding the late F. O. Marshall. Mr. Limbrock formerly held the post of assistant chief engineer.



WILLIAM M. HAYDEN, president, Chemetals Corp.

William M. Hayden, manager of industrial research for the ANACONDA COPPER MINING CO., has resigned to become president of CHEMETALS CORP., New York. Mr. Hayden was with Anaconda and its smelting and fabricating subsidiaries since 1927.

Ules W. Ketchum was named Grand Rapids district representative of the SOLAR STEEL CORP., River Rouge, Mich., succeeding Charles J. McCormick, who was transferred to the Detroit division.

L. R. Gustin, formerly general foreman of the bolt and nut department of BETHLEHEM PACIFIC COAST STEEL CORP., Los Angeles, has been advanced to the position of assistant superintendent of that unit.

M. Russell Kambach has been named advertising manager for ALUMINUM CO. OF AMERICA. Mr. Kambach, who has been serving as assistant advertising manager, will be succeeded by Jay M. Sharp.

Arthur W. Emmons was appointed to fill the newly-created post of industrial sales representative in the New England area for PAULSEN-WEBBER CORDAGE CORP., New York.



HARRY A. DENNIS, manager of sales for stainless and alloy steels division, Graver Tank & Mfg. Co., Inc.

Harry A. Dennis was made manager of sales for the stainless and alloy steels division of the GRAVER TANK & MFG. CO., INC., East Chicago, Ind. He will continue his present assignment as manager of weldment sales.

Henry T. Lowell was appointed manager of sales for the small AC control section of WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

W. T. Pitzer became manager of the central district manufacturing and repair plant at Homewood, Pa., for WESTINGHOUSE ELECTRIC CORP.

Henry B. Ahlers has been appointed assistant to John K. Hodnette, vice president and general manager of WESTINGHOUSE ELECTRIC CORP.'S industrial products divisions.

J. E. O'Conner has been appointed manager of packing and special products sales department of the GOOD-YEAR TIRE & RUBBER CO., replacing W. F. Ong, who has been appointed manager of wringer rolls sales department.

Walter A. Frazee became senior vice president and Aubrey H. Milnes vice president in charge of engineering and sales for the STEEL IMPROVEMENT & FORGE CO., Cleveland.

Robert S. Neblett, assistant general manager of the GENERAL ELECTRIC CO.'S nucleonics department, has been appointed business and construction manager of the Knolls Atomic Power Laboratory. Mr. Neblett, in his new capacity, will handle all business and contractual relations between the laboratory and the Atomic Energy Commission.



Hanson's Supreme, bred and owned by J. A. Hanson, Corvallis, Oregon.

Just another chicken?

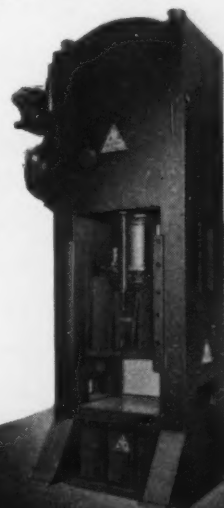
This hen holds the world record for egg production by a leghorn—349 eggs in the 357-day official test. Her record, like the production record of a Clearing press, was not accidental, but resulted from long selective breeding toward a definite purpose.

Despite outward appearance, a Clearing is never "just another press". The factors that increase production are found in Clearing design and construction as a result of long selective development and study directed toward that definite purpose.

There's a lot more to press output than "strokes per minute". We'll be happy to explain — and prove — at your request.

CLEARING PRESSES

THE WAY TO EFFICIENT
MASS PRODUCTION



CLEARING MACHINE CORPORATION

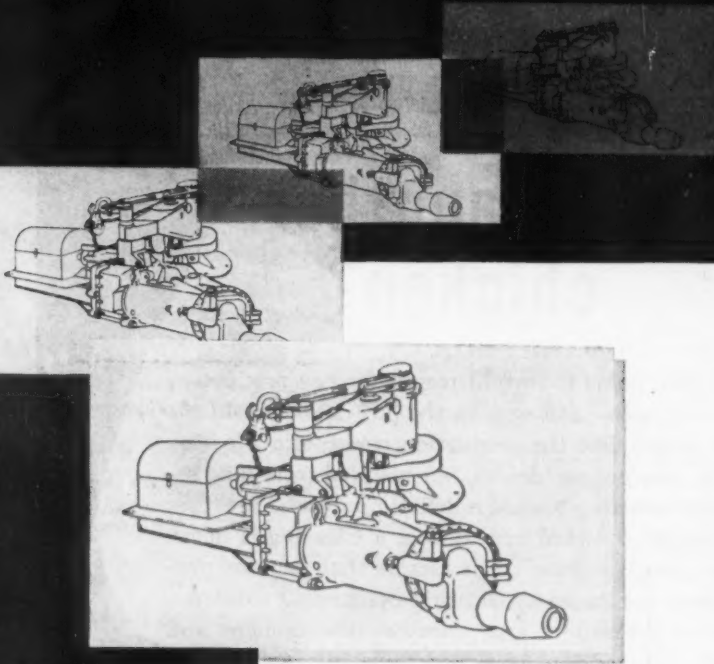
6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS



Remember to specify

BROSIUS

for ruggedly built
more efficient Clay Guns



* Here are two very good reasons why Brosius Clay Guns are so highly practical to operate and maintain. First, they are backed by many years of specific blast furnace engineering skill and experience; and second, each gun is individually designed, machined, assembled, inspected, and tested at the Brosius factory. For more information and literature on sturdy low-cost electric-mechanical, electric-hydraulic or steam guns, simply write to us.



Edgar E.
BROSIUS
Company Inc.

SHARPSBURG • PITTSBURGH 18, PA.

IRON AGE INTRODUCES

Continued



JOSEPH H. REID, director and member of the executive committee, Titanium Division of National Lead Co.

Joseph H. Reid, manager of the Titanium Division of NATIONAL LEAD CO., has been elected a director and member of the company's executive committee, succeeding Claude F. Garesche.

R. S. Atkinson was made sales manager of the Romec division of LEAR, INC., Elyria, Ohio. Mr. Atkinson will direct the sales of Lear-Romec industrial and aircraft pumps and valves.

John R. Harrison was promoted to the post of district manager in charge of maintenance and construction in the Owensboro sub district for the TEXAS GAS TRANSMISSION CORP.

Joseph W. Powell, Jr., was elected president of CIRCO PRODUCTS CO., Cleveland, replacing John F. Black who resigned as president and director. Fenton M. Davison, vice president, has been placed in charge of all company operations.

O. A. Tucker has been appointed vice president in charge of sales and general administration for the PACIFIC CAR & FOUNDRY CO., Renton, Wash. He had previously been vice president in charge of operations.

John W. Wilkinson was appointed general sales manager of the McKIERNAN-TERRY CORP., with plants at Harrison and Dover, N. J. Mr. Wilkinson has for the past ten years been associated with the Pomona Pump division of Fairbanks, Morse & Co. as their field project engineer directing sales activity in the eastern area.

Farquhar Hydraulic Press

*Cuts
Costs*

on
cold-shearing operation



**Your Farquhar Press
pays for itself under our
Deferred Payment Plan!**

Now you can put a Farquhar Press to work in your plant and make easy payments out of the increased production and savings it effects. Our plan is simple and quick... with no red tape. You merely make a moderate down payment on the Farquhar Press you need, and pay the balance in monthly installments tailored to fit your operating budget. Don't let a temporary shortage of capital keep you from modernizing your plant... inquire about Farquhar's Deferred Payment Plan today. Write:

A. B. FARQUHAR COMPANY
Hydraulic Press Division
1503 DUKE STREET • YORK, PA.

THE Albion Malleable Iron Company relies on this 200-ton self-aligned, gap-type Farquhar Hydraulic Press for cold-shearing gates from automotive castings in its Albion, Michigan, plant.

Built-for-the-job Farquhar Hydraulic Presses can be an asset to your plant, too! Rapid advance and return of the ram assures faster

production... extra guides on moving platen give greater accuracy... fingertip controls afford smoother operation... positive control of speed and pressure insures longer die life!

Write today for complete information on how Farquhar Presses can help you get faster, better, cheaper production in your plant!

Farquhar
HYDRAULIC PRESSES

for Bending - Forming - Forging - Straightening - Hobbing - Assembling
Drawing - Extruding - Joggling - Forging - and other Metalworking Operations

Now every shop can have the advantages of

BAND SAWING



The new WELLS
Model 49 A
METAL CUTTING
BAND SAW

No longer does any shop need be without the advantages of band sawing for metal cut-off work. The new Wells Model 49A fits the smallest shop's budget, yet it does a man-sized job in any plant. From its welded steel frame to its tubular steel base, the Wells Model 49A is a rugged shop tool that will give long, dependable service. Its portability is unequalled. Easy to operate without special training, the Model 49A can be used by anyone in the shop. Automatic shut-off at the end of the cut eliminates the need for the operator to stand by. The continuous cutting action, utilizing every tooth of the band saw blade, means more economical cutting too. Write for complete details, today.

DESIGN DETAILS

Capacity: Rectangular, $3\frac{1}{2}$ " x $6\frac{3}{8}$ "; Rounds, $3\frac{1}{2}$ " diameter.
Blade: Size— $\frac{1}{2}$ " x .025" x 5'
Motor: $\frac{1}{6}$ HP, Ball Bearing—foot mounting.
Speeds: Selective (belt change) 54, 100, 190 f.p.m.
Drive: "V" Belt.
Vise: Quick action.
Blade Guides: Stationary brackets with adjustable blade guides.
Wheels: Disc type idler and drive wheels, mounted on grease-sealed ball bearings.
Blade Tension: Incorporated in frame design.
Switch: Manual — automatic stop.
Height to top of Bed: 24"
Bed Area: $6\frac{1}{2}$ " x 24"
Floor Space: $16\frac{1}{2}$ " x 38"
Net Weight: Approx. 118 lbs.



Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
202 WASHINGTON AVE., THREE RIVERS, MICH.

IRON AGE INTRODUCES

Continued

John M. Mitchell has been appointed manager of ALUMINUM COMPANY OF AMERICA'S export division and G. B. D. Peterson has been named head of the division's New York office.

Carl L. Sadler, Jr., was promoted to chief engineer of the hydraulic division of SUNDSTRAND MACHINE TOOL CO., Rockford, Ill. He has been with the company for the past two years, serving in the capacity of assistant chief engineer of the hydraulic division.



PETER T. MATZEN, works manager, Hancock Steel Co., Inc.

Peter T. Matzen has been appointed works manager for the HANCOCK STEEL CO., INC., Detroit. For the past 24 years, Mr. Matzen has been with CHRYSLER CORP. as supervisor of by-products activities.

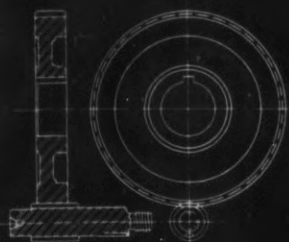
E. L. Mathy was made sales and advertising counselor for NATIONAL WELDING EQUIPMENT CO., San Francisco. Mr. Mathy formerly had been associated with Victor Equipment Co. as first vice president and director for more than 20 years.

W. L. Tomlinson has been promoted to the post of manager of automotive glass sales for the PITTSBURGH PLATE GLASS CO. Associated with Pittsburgh Glass since 1928, Mr. Tomlinson has served as Detroit district manager of industrial glass sales during the past seven years.

George W. Westfall was named manager of market research for HOT-POINT, INC., Chicago. Mr. Westfall will direct market analysis and forecasting related to kitchen and home laundry appliances.

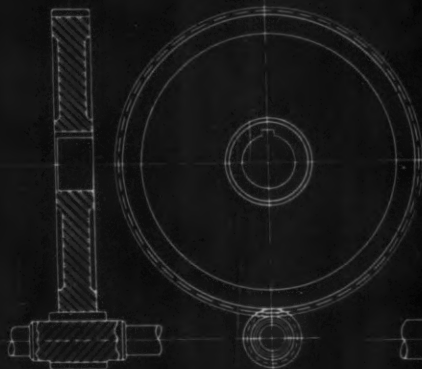
Turn to Page 152

Duti-Rated



**DUTI-RATED STANDARDIZED
GEAR SETS**

Capacity at 1750 RPM... 6 h.p.
Center Distance..... 2.875 in.
Face Width..... .8125 in.
Weight..... 4.8 lbs.



ACCURATE INDUSTRIAL GEARS

Heat-treated, Hobbed, Shaved

Capacity at 1750 RPM... 6 h.p.
Center Distance..... 4.500 in.
Face Width.....* 1.000 in.
Weight..... 14.6 lbs.



COMMERCIAL GEARS

Heat-treated, Hobbed

Capacity at 1750 RPM... 6 h.p.
Center Distance..... 6.300 in.
Face Width..... 1.500 in.
Weight..... 41.3 lbs.

GEAR SETS RATED TO YOUR JOB

A MAJOR ADVANCE IN GEAR APPLICATION

SPECIFIC APPLICATION OF DUTI-RATED GEARS

In the analysis of a specific application, the Foote Bros. **Duti-rated** Gear Set of 60 Rockwell C Hardness made by the **Duti-rated** process method, was able to do the work of an accurate industrial gear set made to a heat-treated, hobbed and shaved construction in 64% of the center distance and 33% of the weight. This same gear set was able to do the work of a commercial grade gear set of heat-treated and hobbed construction in 46% of the center distance and 12% of the weight.

Foote Bros. has now made available to designing engineers and equipment builders a new product—Standardized precision **Duti-rated** Gear Sets that may be as conveniently selected as antifriction bearings. Sizes range from 1 h. p. through 200 h. p. with a wide selection of ratios and center distances. **Duti-rated** Gears are available in helical sets (parallel shafts) and worm gears (right angle drives).

These gear sets may be directly applied to the solution of your gear problems with all the available factors of life, load and type of service taken into consideration. They are pre-engineered, produced under most exacting controls and pre-tested to meet your requirements.

Duti-rated Gears offer new advances in gear production achieved through improved design, new manufacturing processes, the most advanced standard and special facilities, and better control

of methods and heat-treatment. **Duti-rated** Gears represent a new conception in gear accuracy and precision. File hard tooth surfaces and tough, resilient cores give more load carrying capacity—longer wear life.

Duti-rated Gears bring you these advantages:

- Simplified and dependable gear selection.
- Cost saving of from 10% to 50% or more.
- Standards of accuracy never before commercially available.
- High mechanical efficiency.
- Important space and weight savings in gears and related parts.
- Quiet operation.
- Quickly available.

Every engineer and every builder of equipment should learn more about this advanced method of gear selection and application. Mail the coupon for engineering manual DRA today.

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
4545 South Western Blvd., Chicago 9, Illinois

Foote Bros. Gear and Machine Corporation
Dept. M, 4545 S. Western Boulevard
Chicago 9, Illinois

I am interested in the application of standardized **Duti-rated** Gear Sets. Please send me Engineering Manual DRA.

Name.....

Company.....

Position.....

Address.....

City.....State.....

March 9, 1950

129

FREE

Continued from Page 34

aire blower when directly connected to standard speed motors. *Standard Stoker Co., Inc.* For more information, check No. 12 on the postcard on p. 35.

Bandsaw Wheel Tires

Advantages of the Jiffy-Tire, moulded of automobile tread rubber with a steel backbone running through the tire, are described in a 4-p. folder on bandsaw tires for any size from 12 to 38 in. *Carter*

Products Co. For more information, check No. 13 on the postcard on p. 35.

Combustion Unit

Designed for carbon and sulfur analyses in iron and steel by direct combustion at temperatures in excess of 3000°F, the new Lindberg H-F induction heating unit is described in a 2-p. bulletin. *Lindberg Engineering Co.* For more information, check No. 14 on the postcard on p. 35.

Windows and Doors

Types and sizes of Bayley steel windows and doors are listed in a 36-p. catalog containing specifications, full-size cross section and construction details, and data on

operating hardware. *William Bayley Co.* For more information, check No. 15 on the postcard on p. 35.

Bearing Material

How to get longer bearing service is shown in a new booklet containing complete data on how to specify, melt and pour Babbitt, and how to prepare shells for stronger bonds. *National Bearing Div., American Brake Shoe Co.* For more information, check No. 16 on the postcard on p. 35.

Carbide Tools

A partial list of products displayed in the new 92-p. catalog includes carbide tools, blanks, wire drawing dies, drills, end mills, blades, Tantung castings technical data and a new line of vertical and horizontal toolholders. *Vascoloy-Ramet Corp.* For more information, check No. 17 on the postcard on p. 35.

Aluminum Casting Alloys

The metallurgy of aluminum casting alloys is described in detail in a new 40-p. booklet covering pouring, shrinkage, dross control, solution treating, aging, stress relief, corrosion, test bars, gas absorption and effect of moisture. *Federated Metals Div., American Smelting and Refining Co.* For more information, check No. 18 on the postcard on p. 35.

Metallizing Gun

Metallizing for a variety of industrial applications is discussed in an 18-p. booklet describing the Mogul metallizing gun and accessories. *Metallizing Co. of America.* For more information, check No. 19 on the postcard on p. 35.

Turning and Tapering

The Turnomat, a precision attachment for lathes or screw machines, to turn or taper long and intricate parts difficult to make by ordinary procedures, is described in a new 4-p. folder. *Todd Co., Inc.*

Turn to Page 132

It's EASY to install "Payroll Savings"

If you've put off installing the Payroll Savings Plan in your company because you feel it would be "a lot of work," you're in for a pleasant surprise! Here's all you have to do to give your employees the advantages of investing in U. S. Savings Bonds the easy, automatic "Payroll" way:

Appoint one of your top executives as Savings Bonds Officer. Tell him to get in touch with your State Director, Savings Bonds Division, U. S. Treasury Department.

The State Director will provide application cards for your employees to sign—plus promotional material and personal help.

Employees who want Savings Bonds will fill-in the applications.

Your payroll department will arrange to withhold the specified amounts, arrange to get the Bonds, and deliver them to the employees with their pay.

The Bonds may be obtained from almost any local bank or from the Federal Reserve Bank or may be issued by the company itself upon Federal certification.

If you're skeptical as to how many of your employees would like Payroll Savings, just canvass your plant. Within only six months after one doubting manufacturer installed the Plan, half his employees signed up. A prominent aircraft manufacturer, whose company had used the Plan for some time, was



not aware of its potentialities until his personal sponsorship increased participation 500%!

The benefits of Payroll Savings are big. The individual employees gain security—Bonds return \$4 for \$3 at maturity. The company gains from the resultant increased stability and efficiency of its workers. The whole nation gains because Bond sales help stabilize our economy.

Better talk with your State Director!

The Treasury Department acknowledges with appreciation the publication of this message by

THE IRON AGE

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.



STANDARDIZED!

...to give you
custom-built quality at
greatly reduced cost

Now...at a big reduction in cost...
your plant can enjoy the advantages of a
versatile hydraulic press.

- Available in three popular capacities—100, 150 and 200 tons.
- For drawing, forming, straightening, bending, coining and many other shop operations.
- Furnished in four practical combinations:

- 1 Single-action normal-speed, with hand-lever operation.
- 2 Single-action with cushion, normal-speed hand-lever operation.
- 3 Single-action with high-speed push-button operation.
- 4 Single-action with cushion, high-speed push-button operation.

To meet the needs of plants that can use hydraulic presses to advantage...but that do not have requirements for costly custom-built models...we have developed the "Series DF" line. Through standardization and new ideas in construction, we have reduced costs and at the same time maintained the high manufacturing standards of our more expensive custom-built equipment. Here is a press that can slash costs on many products and that can be installed for a modest investment. Write for complete details. Or ask us to have a representative call to discuss these presses and their applications in your plant. No obligation.



FULLY DESCRIBED
IN BULLETIN 749

WRITE FOR A COPY

LAKE ERIE
ENGINEERING CORP.
BUFFALO, N.Y. U.S.A.

LAKE ERIE ENGINEERING CORP.

MANUFACTURERS OF
HYDRAULIC PRESSES AND SPECIAL MACHINERY
General Offices and Plant:

368 Woodward Avenue Buffalo 17, New York

DISTRICT OFFICES IN NEW YORK, CHICAGO and DETROIT

Representatives in Other Principal Cities in the United States and Foreign Countries

Leading manufacturer of hydraulic presses—all sizes and types
Metal Working...Plastics Molding...Forging...Metal Extrusion...Processing...Rubber Vulcanizing...Stereotype Molding
Plywood...Hardboard...Special Purpose.

LAKE ERIE

March 9, 1950

131



All this to acquaint you with a really reliable source for QUALITY CUSTOM GEARS at competitive prices

Reproduced here in miniature, are some of our recent advertisements which appeared in various engineering magazines.



Springfield 7-4751

PERKINS
Custom-cut
GEARS

IN ANY MATERIAL,
METALLIC, NON-METALLIC & IN ANY QUANTITY



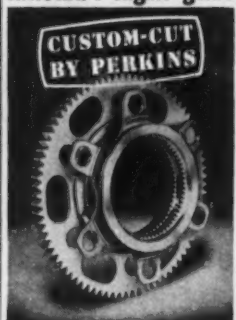
IF THE GEARS IN YOUR PRODUCT ARE CUSTOM-CUT BY PERKINS...

YOU CAN STATE IN REPLY TO ITS TROUBLE-SOME POWER TRANSMISSION

IF Gears on the demand line
The long-known to largely...
PERKINS MACHINE & GEAR COMPANY
Springfield, Massachusetts

We'll Produce the Gears!

AIRCRAFT engine gears



The highly complex gear shown here is an example of the many...
PERKINS MACHINE & GEAR Co., West Springfield, Mass.

contact PERKINS first for custom-cut GEARS

We have manufactured precision gears to industry specifications for nearly 50 years...
PERKINS MACHINE & GEAR Co., Springfield 1, Mass.

FREE TO GEAR BUYERS

Everything that Purchasing Executives, Design and Production Engineers would want to know about a potential source of supply for their custom gear requirements is covered in this new bulletin on PERKINS GEAR ENGINEERING SERVICE
Write now for your copy!

PERKINS MACHINE & GEAR COMPANY
West Springfield, Massachusetts
Springfield 7-4751

PERKINS Precision Gears in Production Quantities

AT COMPETITIVE PRICES

Whenever your custom gear requirements may be, here in our modern plant we have all conceivable facilities for providing practically every type of gear from the smallest to the largest...
PERKINS MACHINE & GEAR COMPANY
West Springfield, Massachusetts
Springfield 7-4751



Let PERKINS' GEAR SPECIALISTS save you money!
A considerable amount of it has been...
PERKINS MACHINE & GEAR Co., Springfield 1, Mass.

PERKINS MACHINE & GEAR Co.
WEST SPRINGFIELD, MASSACHUSETTS

FREE PUBLICATIONS

Continued

For more information, check No. 20 on the postcard on p. 35.

Boring and Turning Mills

Consolidated vertical boring and turning mills, 14 to 35 ft and larger, are shown in a 14-p. catalog listing general specifications. **Consolidated Machine Tool Corp.** For more information, check No. 21 on the postcard on p. 35.

Pillow Blocks

Ohio ball bearing pillow blocks in 4 shaft sizes and 6 bearing series are described in a bulletin giving specifications for stock sizes. **Ohio Ball Bearing Co.** For more information, check No. 22 on the postcard on p. 35.

Vibration Control

Westorb vibration absorbing felt for machine mountings is described in an 18-p. booklet on vibration control. **Western Felt Works.** For more information, check No. 47 on the postcard on p. 35.

Press Brake and Flanger

Details of the Beatty hydraulic press brake and flanging machine in various capacities are given in an 8-p. booklet also describing allied equipment. **Beatty Machine & Mfg. Co.** For more information, check No. 48 on the postcard on p. 35.

Bolster Plates

Danly standardized bolster plates, made to Joint Industry Conference specifications for die interchangeability, are described in a 4-p. illustrated folder. **Danly Machine Specialists, Inc.** For more information, check No. 49 on the postcard on p. 35.

Sharpening Machine

Construction, specifications and operating features for the Barber-Colman HRS combination sharpening machine are presented in a 16-p. booklet illustrating a number of typical applications. **Barber-Colman Co.** For more information, check No. 50 on the postcard on p. 35.

Resume Your Reading on Page 35

DEAD SOFT... AND EASY ON YOUR WIRE WORKING MACHINES

WISSCO SPHEROIDIZED WIRE



Steel with this grain structure resists forming and is tough on wire working tools and dies.

Spheroidizing changes the free cementite in steel from elongated shapes to small nodules or spheroids thus rendering the steel soft and ductile.

Here's a wire that is really friendly to forming dies and wire working machines. It's dead soft . . . takes severe bends beautifully . . . is easy to cut, swage, grind and polish. After forming, its temper or hardness can be restored.

Because of these characteristics, Wissco Spheroidized Wire is ideally suited for making screw drivers, awls, ice-picks, parts of toys and other products the manufacture of which calls for severe wire forming.

The secret of the superiority of Wissco Spheroidized Wire lies in the use of specially selected heats of steel and exacting control of the heat treating operation to insure complete and uniform heating of each batch of wire.

If you want further information on Wissco Spheroidized, or any of Wickwire Spencer's innumerable types of high or low carbon steel specialty wires, won't you write us? Our metallurgists have a reputation for finding the answers to unusual wire applications.

WISSCO Wire

A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION - THE COLORADO FUEL AND IRON CORPORATION

WIRE SALES OFFICE—361 DELAWARE AVE., BUFFALO 2, N. Y.

EXECUTIVE OFFICE—500 FIFTH AVE., NEW YORK 18, N. Y.

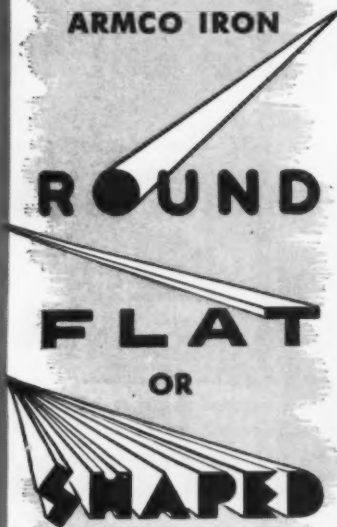
SALES OFFICES—BOSTON · CHICAGO · DENVER · DETROIT · NEW YORK · PHILADELPHIA

PACIFIC COAST SUBSIDIARY—THE CALIFORNIA WIRE CLOTH CORP., OAKLAND 6, CAL.



PAGE WIRE

LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
ARMCO IRON



**You draw the Shape
—Page can draw the Wire**

—the way you want it for your production—whether it's ALL of your product, or only a part.

Cross-sectional areas up to .250" square; widths to 3/8"; width-to-thickness ratio not exceeding 6 to 1.

**for Wire or
Information about Wire—**

*Get in touch
with Page!*



Monessen, Pa., Atlanta, Chicago,
Denver, Detroit, Los Angeles, New York,
Pittsburgh, Philadelphia, Portland,
San Francisco, Bridgeport, Conn.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

NEW

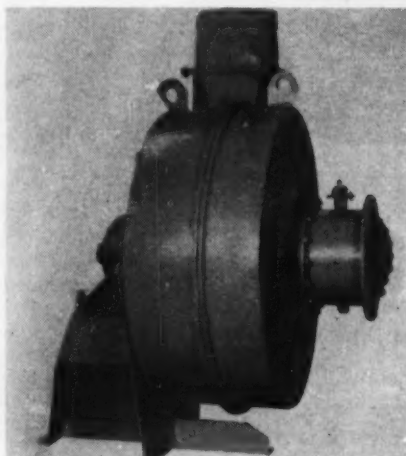
PRODUCTION IDEAS

Continued from Page 38

linkage that multiplies foot pressure many times. Whitney-Jensen foot presses have a capacity of 2-in. hole through 16 gage mild steel or the equivalent. Accessories include large work tables, guides, gages, punch holders, and die shoes. *Whitney Metal Tool Co. For more information, check No. 36 on the postcard on p. 35.*

Large Volume Blowers

Seven new blower sizes in the 300 Series, are of the large volume, low pressure type and come in either single or two-stage units. They may be a directly connected



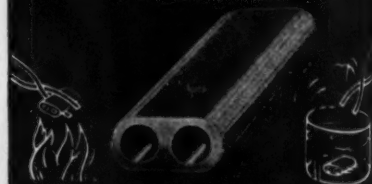
style or with V belts transmitting the power from the motor to the blower impellers through a jackshaft. Four ounce blowers give 4000 and 4700 cfm with 7 1/2 and 10 hp 1750 rpm motors respectively. Eight ounce blowers give 2480, 4250 and 4800 cfm with 10, 15 and 20 hp 1750 rpm motors. Two blowers with 50 and 60 hp 3600 rpm motors give 6000 and 7560 cfm respectively. *North American Mfg. Co. For more information, check No. 37 on the postcard on p. 35.*

Pumping Units

High pressure oil-hydraulic pumping units to meet fluid power requirements of machine tools and industrial equipment are available

Be Certain WITH "SERV-RITE"

THERMOCOUPLE INSULATORS



This Gordon Thermocouple Insulator, heated red hot and plunged into cold water, came out just as good as new

Available only through GORDON, Serv-rite Thermocouple Insulators are made to stand the gaff of excessive thermal shock far above normal requirements.

For sturdy and reliable thermocouple insulator performance to meet peak production needs—Specify Serv-rite...a Gordon development backed by 32 years' experience in supplying industry with insulators that last longer and give better results.



Serv-rite Thermocouple Insulators—in any type or size—can be supplied immediately from Gordon's large stocks in the Chicago and Cleveland Plants. Remember—you can always distinguish Serv-rite Insulators by their tan color.

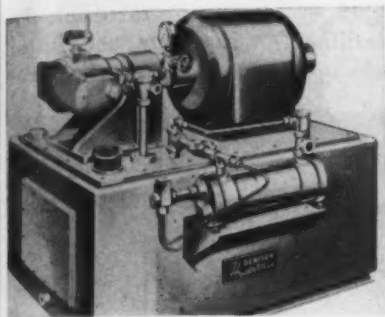
Fish Spine Beads Asbestos String
Asbestos Tubing Single Hole
Double Hole Round Double Hole Oval

CLAUDE S. GORDON CO.

Specialists for 32 Years in the Heat Treating and Temperature Control Field

Dept 16 • 3000 South Wallace St., Chicago 16, Ill.
Dept 16 • 2035 Hamilton Ave., Cleveland 14, Ohio

in 22 models with regulative pressures up to 5000 psi. Each unit consists of a reservoir base with operating components, including pump, relief valve, gages, and electric motor drive, mounted on the



removable top cover. Reservoir capacities are 55, 110, and 165 gal. A choice of three series of Denison hydraulic pumps is offered. These are axial piston type for either constant or variable volume. *Denison Engineering Co. For more information, check No. 38 on the postcard on p. 35.*

Tool Holder

Rigidly holding wide tools on comparatively narrow bases with complete absence of chatter is a feature of a new tool holder. The holder can mount two tools and by



swinging end for end, all lathe operations such as threading, forming, cutting off, etc., can be performed. Two popular sizes are in production for use on 9 to 16-in. lathes. *W. H. Sackman Co., Inc. For more information, check No. 39 on the postcard on p. 35.*

Power Operated Chucks

Power operated chucks with body made of Whitalloy forgings are constructed to insure great gripping power, while chuck weight has been reduced considerably. Whitalloy is a special analysis, heat

DUSTUBE IS THE FEATURE VALUE

from every point of view!

Mr. F. T. Hartman
FOUNDRY SUPERINTENDENT
(American Malleable Castings Co.)

"We take a great deal of pride in the cleanliness and dust free condition of our foundry. The Dustube Dust Collector is an important unit in maintaining this condition. All of our cleaning machines are ventilated by the Dustube and dust around these units is a thing of the past. Our operating costs are confined to supplying power for the fan and shaker — this is exceptionally low due to the ample spacing of tubes, which decreases resistance to air flow."



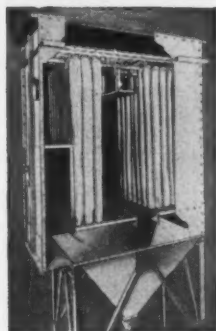
Mr. H. H. Neiser
MASTER MECHANIC
(American Malleable Castings Co.)

"After the unfavorable experience we had with our _____ type dust collector, the Dustube is the most trouble-free unit I have ever seen. There has been absolutely no maintenance. In the past year we have never changed even one tube — this is probably due to the fact that the tubes are never under tension or in contact with metal which would corrode and abrade the cloth fabric."



Mr. Dale Ward
CLEANING ROOM SUPERINTENDENT
(American Malleable Castings Co.)

"Our Dustube Dust Collector has given us so little trouble that were it not for the fact that our cleaning room is so completely free of dust, we would have forgotten that it is there at all. However, several features of the Dustube have been favorably impressed upon me: The first being the fast and thorough method of removing accumulated dust from the bags; secondly, the absence of any bridging of dust or clogging of the tubes; and lastly, the long life of the cloth tubes."



DUSTUBE ADVANTAGES

*Better Dust Removal
Power Savings
High Efficiency
Ease of Operation
Dustube Filters
Filter Replacement*



Write today for complete information about the many advantages of Dustube collectors. Ask for Catalog 72-A.



American

OFFICES IN PRINCIPAL CITIES

dustube
COLLECTORS

AMERICAN WHEELABRATOR & EQUIPMENT CORP. 510 S. Byrkit St. Mishawaka 3, Ind.

March 9, 1950

135

P&H CRAWLER CRANES...

**all around
the yard!**

Your biggest opportunity for cost cutting today is in materials handling in yards! You'll find no surer way to yard-wide efficiency than with a P&H Crawler Crane.

This one machine, operated by one man, gives you the fast, flexible, safe operation that pays big dividends in materials handling. You get more with P&H Added Value features. Write for literature, today.



P&H MAGNET CRANES

For fast, low-cost scrap handling, you can't beat a P&H Crawler Crane with magnet. Quickly converts to crane, clamshell, dragline.

P&H

INDUSTRIAL CRAWLER CRANES

4401 W. National Ave., Milwaukee 14, Wis.

HARNISCHFEGGER

BRISTLE - WELDING ELECTRODES - MOTORS - EXCAVATORS - ELECTRIC CRANES - ARC WELDERS

**for all-round
materials
handling...**

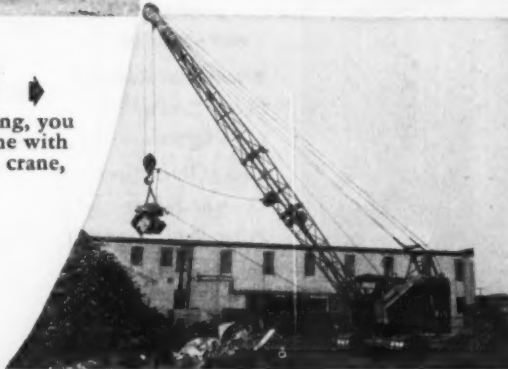


P&H CRAWLER CRANES

Easier operation and safer handling. You'll have smooth, responsive P&H Direct Acting Hydraulic Control. Working in out-of-the-way places and close quarters... save time... save money... with the P&H simplified method of steering and braking.

P&H CRAWLER CLAMSHELLS

For swifter handling of bulk materials, anywhere in the yard! Not restricted to areas served by trackage. Wide crawlers and all-weather cabs permit year-round efficient service.

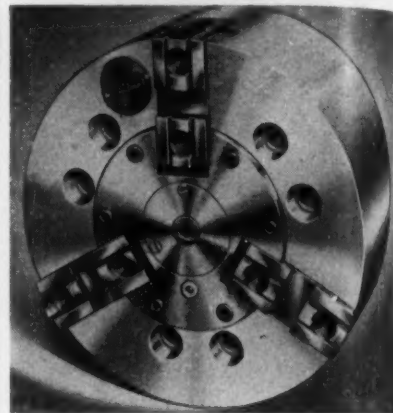


P&H Industrial
Crawler Cranes
Built in Models for all
Yard Requirements

NEW PRODUCTION IDEAS

Continued

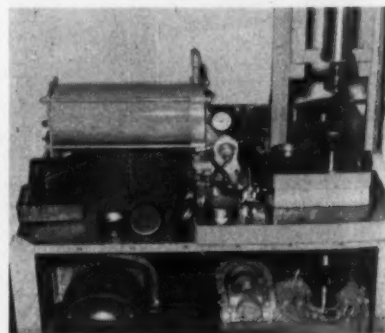
treated, aluminum alloy said to possess the strength of steel and wearing quality found in cast iron. Whiteloy power operated chucks facilitate quick starts and stops, help to eliminate spindle drag, re-



ducing strain on the braking mechanism of the machine tool. The wedge and three jaws are the only moving parts of the chuck. Power most commonly used for developing the gripping pressure is supplied by air cylinder. *Whitton Machine Co.* For more information, check No. 40 on the postcard on p. 35.

Drawn Shell Trimmer

Trimming the flat edge of drawn stampings is possible with a new universal drawn shell trimmer. The machine will trim drawn shells of practically any depth up to 16 gage



material, with minimum radii on irregular shells of $\frac{1}{8}$ in. The external rotary cutter blade is provided; a profile mandrel $\frac{1}{2}$ in. thick to fit the drawn finished shell must be built to engage the cutter blade at the point of the trimming operation. Work cycle can be varied, and trimming operation is rated at

**REVOLUTIONARY
NEW DESIGN**

YOU CAN
*Change Knives in
10 Minutes*
on this New SECO SLITTER



View showing front housing in operating position.



This 48" pull-through type SECO Slitter makes 7 cuts in .125" material at 300 FPM or 24 cuts in .030" material at 900 FPM. Arbors are 6" in diameter, taking 8 1/2" dia. sleeves and using 14" dia. knives.

Modern, Efficient Slitter Saves Hours of Down Time

With this new SECO Slitter, the complete slitting knife assembly can be changed in only a few minutes—saving many hours of lost production time. Cutters and spacers are pre-assembled on sleeves. To change jobs, the slitter front housing is moved on to a shelf which swings out—giving the operator free access to the knife assembly. The sleeves with the old knife assembly are removed, and the new sleeves and assembly—ready for immediate production on the next job—are placed on the arbors.

This ingenious and cost-saving idea is only one of the many superior features which can be built in to SECO Slitters. Another is the use of eccentric

arbor mountings with Timken tapered roller bearings. This gives a constant pass line for any knife diameter. These modern design and new engineering features make SECO Slitters outstanding in handling the "tough" jobs—where quality, accuracy and speed are major factors.

Efficient SECO equipment is ruggedly built for trouble-free slitting on sheet up to 72" wide—any number of cuts. For more information on SECO Slitters, write today. Our engineers will be glad to furnish full details and operating data—with no obligation to you.

STEEL EQUIPMENT CO. 2890 EAST 83rd ST., CLEVELAND 4, OHIO

SECO

DESIGNERS and BUILDERS of the following STEEL MILL EQUIPMENT

Leveling and Shearing Lines . . . Combination Edging and Flattening Lines . . .
Tension Reels for Strip Polishers . . . Narrow Strip Grinding Machines . . . Multiple
Strand Pull-Out Rolls and Take-Up Frames . . . Strip Coilers of the Up and
Down Coiling Types . . . Traverse Reels for Narrow Strip . . . Scrap Ballers.



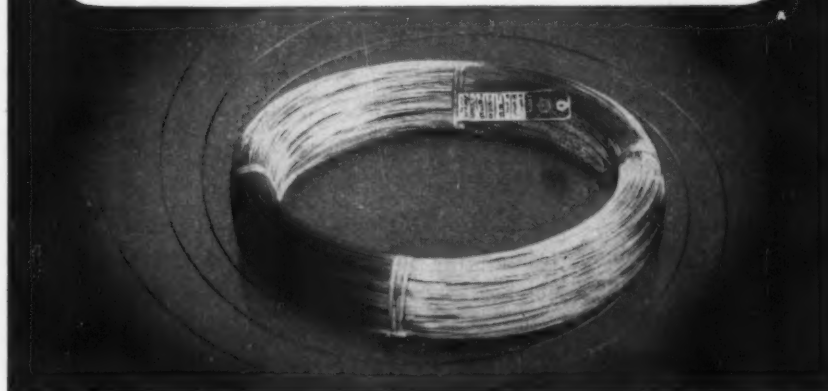
The Salesman:

"Johnson is not a tonnage mill. Although the Johnson line comes under a general heading of high carbon wire, there is a far wider range than that because Johnson draws wire to meet specific applications. Strict laboratory control and supervision assure the customer his own particular requirements will be met. Whether you are in the business of making bobby pins, springs or wire rope, Johnson experienced wire specialists study your problem and come up with the correct answer."

The Customer:

"That is exactly what we want here. Our application is an unusual one and we know enough about wire to realize that it requires careful research, and so we are asking you to show how Johnson meets this situation."

H. Armstrong Roberts Photo



JOHNSON

STEEL AND WIRE CO., INC.

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NEW YORK PHILADELPHIA CLEVELAND DETROIT AKRON CHICAGO
ATLANTA HOUSTON TULSA LOS ANGELES TORONTO

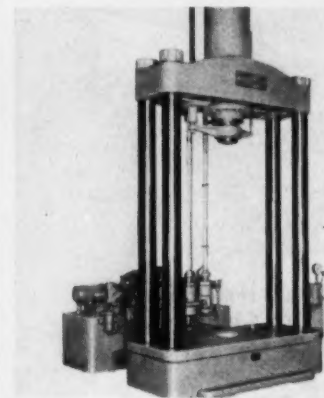
NEW PRODUCTION IDEAS

Continued

65 shells per min. *Dayton Rogers Mfg. Co.* For more information, check No. 41 on the postcard on p. 35.

Forcing Press

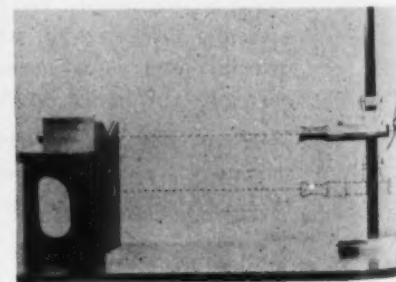
Ram speed of a max 275 ipm features this 150-ton four-post hydraulic forcing press. The unit illustrated is used primarily for the press-fit assembly of shafts to



armatures and rotors, and has an 82-in. gap, ram up, and a 48-in. max stroke. There are 60 in. between columns, left to right, and 10 in. front to back. Pressure applied is controlled by a single hand lever. *Hannifin Corp.* For more information, check No. 42 on the postcard on p. 35.

Height Gage Scope

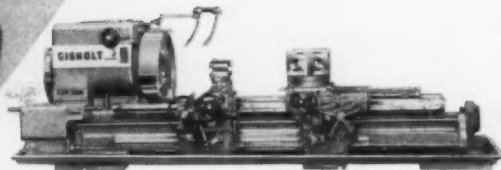
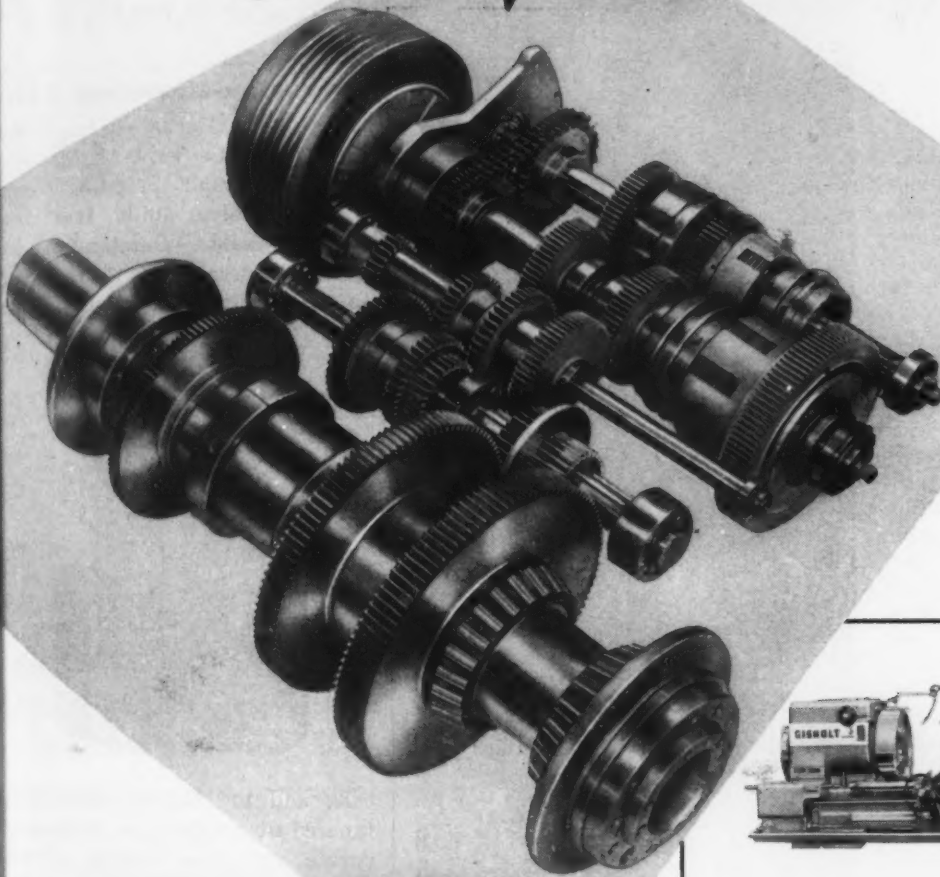
Dimensions which can be seen but not touched can be measured with the Height Gage Scope. The instrument combines the features



of a telescope with a microscope and attaches to any 18 or 24-in. height gage, making a universal shop inspection instrument. It has five power magnification, coated lens, internal focusing, a wide field, and provides an erect image

RUGGED POWER

Silky Smooth



GISHOLT

Saddle Type Turret Lathes

Here's how modern Gisholts are geared for greater production—to deliver smooth, vibrationless power—instantly responsive—dependable for years to come. Note these outstanding features:

1 Gears . . . Husky headstock gearing will carry all the horsepower and all the load of today's tools, as well as that of the foreseeable future. Rigidity is complete from the massive headstock casting right through to the ground teeth in each gear.

2 Clutches . . . Warner Electric Clutches inside the drive pulley do all forward and reverse driving, as well as inching and braking. They never need adjustment and give the smoothest acceleration and braking power ever put on a turret lathe. Instant HI-LO speed changes are obtained at the touch of a finger through hydraulically operated multiple disc clutches.

3 Bearings . . . Two precision tapered roller bearings at the front of the spindle, together with the precision ball bearing at the rear, carry all the radial and thrust load you can give them.

Why not get all the facts? A new bulletin on Gisholt 3L, 4L, 5L Saddle Type Turret Lathes is just off the press. Write for it.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin



THE GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

March 9, 1950

They have FAR-REACHING qualities...

BATTERY trucks such as this one offer far-reaching advantages in warehouse duty. Fast and versatile, they save much time, space and hand labor. Smooth-running and fume-free, they cut product damage. Using dependable, low-maintenance electric drives, they run with a minimum of down-time.

Couple battery trucks with EDISON batteries and you'll have the most reliable handling team going! EDISON cells are built of rugged steel inside and out, and their electrolyte preserves steel. They are electrochemically fool-proof and are not injured even by accidental short-circuiting or reverse charging. They take jars, jolts and accidents as part of the day's routine. That's why they're an outstanding investment.

Write today for free booklet SB 2039 and a current price quotation. You'll find EDISON batteries cost little more than other makes...and they pay this back over and over in terms of low upkeep and long, long life.—

Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey. In Canada, International Equipment Company, Ltd., Montreal and Toronto.



EDISON
Nickel • Iron • Alkaline
STORAGE BATTERIES



Typical Truck Battery

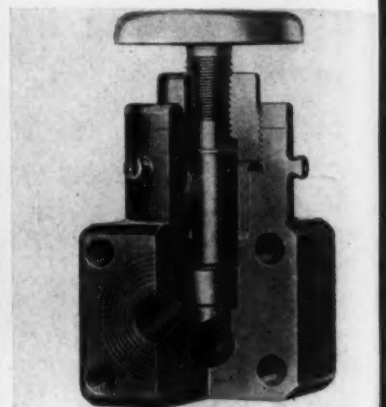
NEW PRODUCTION IDEAS

Continued

throughout a working distance of 2½ in. to infinity. The instrument is 9¼ in. long x 1 7/16 in. diam and weighs 12 oz. *Quality Control Co.* For more information, check No. 43 on the postcard on p. 35.

Corrosion-Resistant Valve

A new Karbate impervious graphite globe valve is designed for shut-off and throttling service with corrosive fluids free from abrasive solids. Outstanding features of the valve are its resistance to practically all corrosive chemi-



icals, and to thermal shock. The tapered disk valve seat assures accurate and close control of fluid flow, and it is self-reseating. The valve is light and small, has short face to face dimensions and is self-lubricating. *National Carbon Division, Union Carbide & Carbon Corp.* For more information, check No. 44 on the postcard on p. 35.

Collector Head

The function of the collector head is to transmit high currents from a stationary to a rotating member. This device replaces copper carbon brushes used in transmitting current in the electroplate tinning line in the steel industry. The collector head insures long life with negligible brush drop because of the inherent design and quality of high conducting materials. It is a compact unit with face plate for mounting on a rotating member, internal built-in pump for lubrication and a face plate for mounting bus bars for the current con-

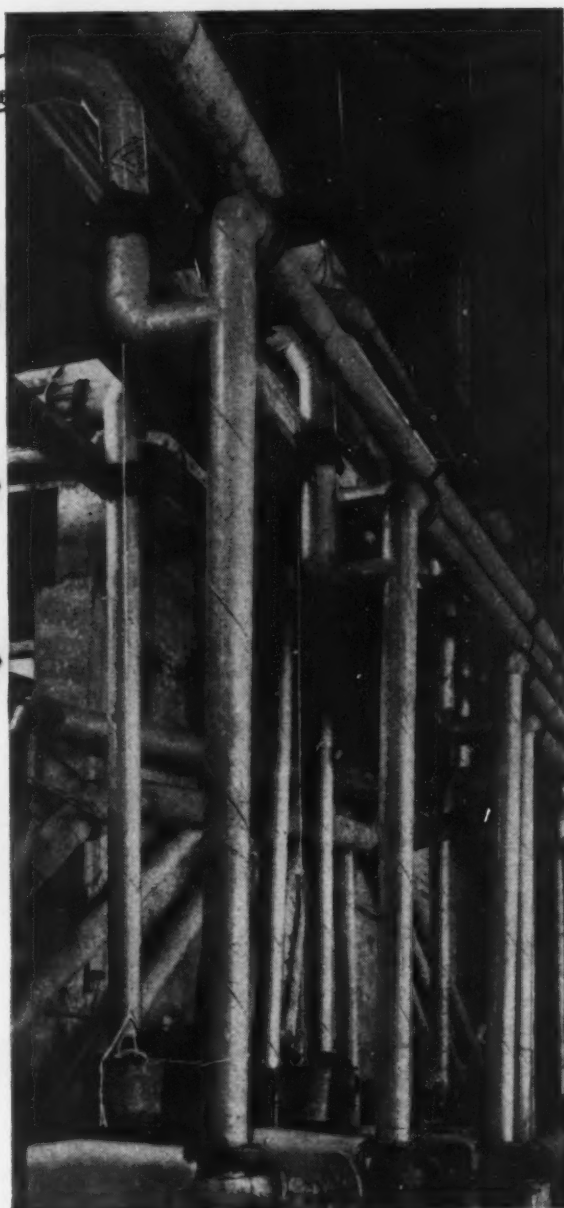
Reduce costs— Speed the job WITH THIS PLANT PIPING

You'll save time and piping dollars by using Armco Spiral Welded Steel Pipe in your plant. It has many advantages for process and fabricated piping as well as water and gas lines.

With Armco Pipe you design for economy by selecting exactly what you need for the job. No paying for excess metal. Diameters range from 6 to 36 inches and wall thicknesses from 9/64- to 1/2-inch.

Special fittings can be prefabricated to specifications. And both special or standard fittings come welded to straight pipe runs to fit your layout. You save a pair of flanges at every bend. Installation is quicker and there is less chance for leaks.

Whatever your needs, you'll find Armco Pipe amply strong; smooth inside for peak flow capacity, lower pumping costs. You can specify optional coatings including galvanized after fabrication for utmost durability and efficiency.



WRITE FOR USEFUL BOOKLET

Send for Armco's Industrial Pipe Manual SWP-8549. It is free to engineers or plant superintendents and contains 42 pages of helpful, authoritative data including tables and charts. Write us today and if you have a specific problem we'll be glad to help. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 3840 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

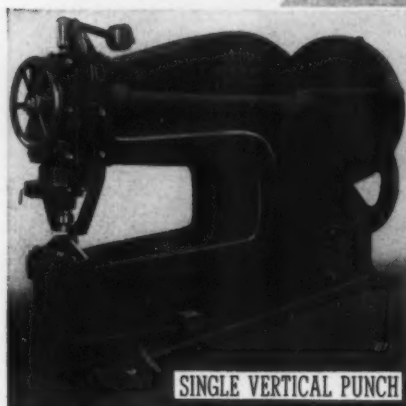
ARMCO WELDED STEEL PIPE



March 9, 1950

141

THE TREND IS TO THOMAS because...



SINGLE VERTICAL PUNCH

THOMAS
MACHINE MANUFACTURING COMPANY

PITTSBURGH 23, PA.

modern frame design,
bronze-lined ram guides,
hand-scraped ways,
anti-friction bearings,
steel cut gears

... all add up to better performance and greater production, the result of Thomas quality standards in construction.

Whether you need a Vertical, Horizontal, Beam or Multiple Punch, from 50 tons up, it is available from THOMAS, tooled to your individual requirements.

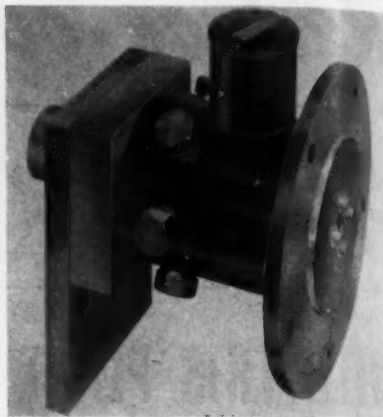
WRITE FOR BULLETIN 303

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

NEW PRODUCTION IDEAS

Continued

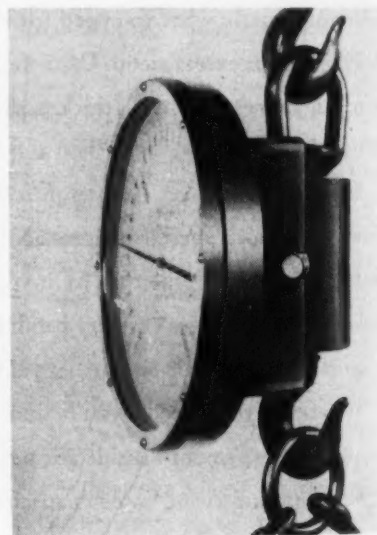
nection. The head illustrated is rated at 10,000 amp continuous de, 12 v at 400 rpm. Heads with dif-



ferent ratings can be supplied. Sciaky Bros., Inc. For more information, check No. 45 on the postcard on p. 35.

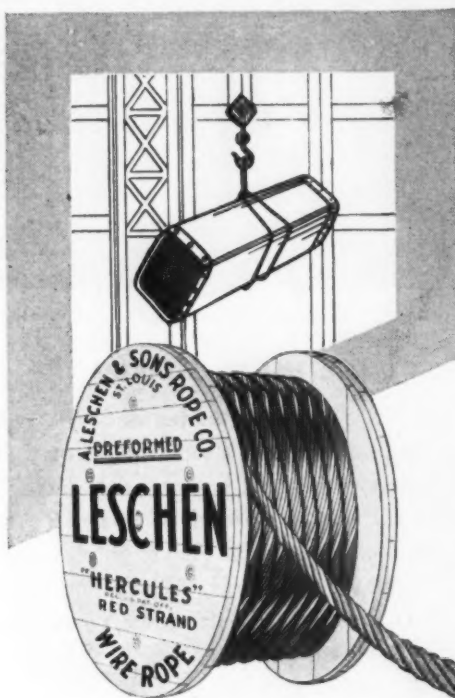
Hydroscales

Designed for weighing stock and materials on the spot without transporting to weighing stations, the line of Hydroscales now includes 8, 12, 24, and 30-in. diam dials in varying capacities up to



25 tons. The Hydroscale, simple in construction, functions on the static pressure principle without the use of levers, weights, and beams commonly found in crane scales. Hydroway Scales, Inc. For more information, check No. 46 on the postcard on p. 35.

Resume Your Reading on Page 39



The Proof of Quality Is in PERFORMANCE

For many years, "HERCULES" (Red-Strand) Wire Rope has been proving its outstanding quality by the accurate yardstick of performance — on all sorts of tough jobs. Such consistent performance is not a matter of chance. Design... rigid tests and inspections... equipment... firm standards — are essential factors.

We Invite
Your
Inquiries

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A. LESCHEN & SONS ROPE CO. 5909 KENNERLY AVE. • ST. LOUIS, MO.

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Chicago 7
Birmingham 6

Houston 3
Denver 2
Los Angeles 21

San Francisco 7
Portland 9
Seattle 4

BUILDERS OF THE BRASS INDUSTRY



ELISHA WELCH

(Second President of BRISTOL BRASS)

*Money-nurseryman . . . Lover of figures . . . Northern secessionist . . .
Man of decimal-details . . . Yet man of broad vision who did even better
than move mountains . . . Hence one of the first U. S. multimillionaires*

DIGGING stumps on a summer afternoon in 1851, Lige Welch rested to talk to teamsters who were hauling Brass from Waterbury to the clock-making capital of Bristol. Good-naturedly, he told them he was going to put them out of business, for, he said: "I can't move the Naugatuck, but I can *and will* build a Brass mill in Bristol."

Bristol Brass and Clock Company's first president, Israel Holmes, heard about this and decided here was a man to join up with, since he couldn't be licked. So on August 5, 1851, Elisha Welch became the second president of Bristol Brass. That was the year of the rise of Louis Napoleon, of the first

World's Fair (in London), of the first stirrings of a political group later known as the GOP. Soon came the War Between the States, during which Welch won Bristol's vote for Breckinridge against Stephen Douglas, for he feared that a Southern defeat would mean the end of Bristol's clock industry.

Welch continued as Bristol Brass president to the day of his death, August 2, 1887, when he had built the company's business to new highs. Also, with the first oil well drilled in Titusville, Pa., in 1859, he set up another company to make burners for kerosene lamps. And Bristol Brass continued to surge ahead, even in hard times, building new business

and also new additions to the mill buildings.

This "damn the torpedoes . . . full speed ahead" kind of management has brought Bristol through five wars and more depressions and "recessions" than you can count. It has become a Bristol tradition that is stronger today than ever before . . . that as long as there is one man alive who wants good Brass sheet, rod, and wire on a certain day . . . then, come hell or high water, *he's going to get it the way he wants it, and when he wants it . . . from Bristol.* And that means you, too, no matter what your product.

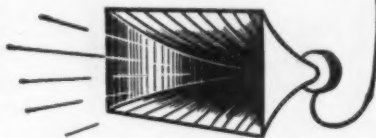


One Hundred Years of BRASS made "BRISTOL FASHION"

Like the world-famed merchant ships from Bristol, England . . . Always prompt, shipshape, reliable

The BRISTOL BRASS CORPORATION, makers of Brass in Bristol, Conn. since 1850

facts speak LOUDEST



At least one type of Molybdenum high speed steel is listed and promoted on a basis of equivalent and interchangeable performance with tungsten steel, by makers of high speed steel.



Users' reports of Molybdenum high speed tools *everywhere* indicate that performance at least equals and in many cases betters that of tungsten tools.



The heat treatment of Molybdenum high speed steels is basically the same as that of tungsten steels. There is nothing in the treatment to confound those who are familiar with the heat treatment of tungsten types.



Molybdenum high speed steels save money in production—for proof send for our FREE booklet.

Climax Molybdenum Company
500 Fifth Avenue • New York City

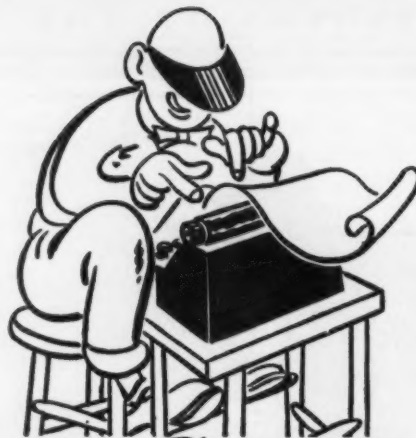


Please send me a copy
of your FREE BOOKLET

Name _____

Company **MOLY**

Address _____
IA3-HS2



Dear Customer

by *Jack R. Night*

COMING SOON: Next week's issue will feature a description of the kind of production problems whipped by Chevrolet in putting its new Powerglide automatic transmission into the 1950 models. This is the first such transmission to go into production where the principal turbine parts are being precision cold formed.

Chevrolet started to work on the job 4 years ago, and started over again at least twice during the period before success was achieved. IRON AGE has been working on the project of getting this particular story for over a year, and has started from scratch at least six times in the process.

Precision stamping the turbine parts represents a departure from practice on other such transmissions, and requires working to very exacting tolerances. The press equipment that is doing the job at the moment is standard modern mechanical press equipment, but the General Motors Division is paying an extra to buy steel sheet with special tolerances as to thickness.

A battery of special spot welding machines is in use in the turbine assembly work, and highly specialized brazing and annealing furnaces are used on a continuous basis. Chevrolet has done a lot of work on the special dies that are used on the stamping presses, and the fixtures used in the assembly work

are considered to be an industrial textbook in ingenuity. Look for it next week.

THE STUFF OF FAME—Copies of the Mar. 2 story on the Venezuelan ore strike which featured an eyewitness account by the editor of THE IRON AGE are winging their way southward as we write. The interest of the Venezuelan government in the article is so keen that formal examination procedures are being waived to get copies to key leaders in Caracas as soon as possible. The Associated Press and the United Press are carrying special stories—the *New York Times* has already quoted THE IRON AGE to verify its own story on the significance of the ore development.

Climax of the opus will come on Mar. 11 in Cleveland when Mr. Campbell will speak to the City Club on the significance of the world iron ore situation. The City Club had some difficulty in getting a reply from our Campbell as to his availability for such an appearance. Just when the invitation came to New York, Tom Campbell was jeep-riding through the Cerro Bolivar ore range in Venezuela. He was, in fact, giving further demonstration to what the City Club had already heard, that he ranked as one of the best informed men in the country on the ore problem. The Cleveland speech will be heard over WGAR at 1 p.m. on Mar. 11.



Industrial chemicals supplied by **HARSHAW**

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Anodes and Processes.
- Driers and Metal Soaps.
- Ceramic Opacifiers,
Colors and Frit.
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- Glycerine.
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Catalytic Chemicals
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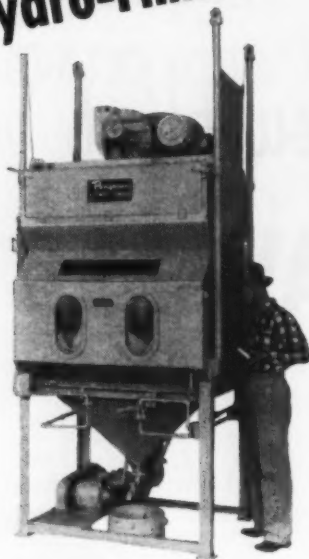
THE HARSHAW CHEMICAL CO.

1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

SEND FOR

- 32 page book listing Industrial Chemicals available and describing Harshaw's Major Activities.
- 36 page book on Hydrofluoric Acid Anhydrous.
- Folder on Perflow, the New Improved Nickel Plating Process.
- Ceramic Materials Catalog.
- Drier Price List on the Full Line of Harshaw Driers.
- Cadmium Lithopone Color Card.
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Dear Editor

CENTRIFUGAL CASTING

We obtained your name and address from Mr. Cossman, at present a member of the ECA Commission for Austria. Our concern, which is the largest foundry in Austria for light and heavy metals, intends to go into the production of centrifugal castings, particularly of those from heavy metals. Due to the fact that our country has been shut off from the rest of the world for the past 10 years, we have been able to follow technical developments only to a small extent; this is true of knowledge and experience throughout the entire world in the foundry industry in general and in the field of centrifugal casting in particular. Our wish, then, is to obtain suitable and adequate literature on the subject.

VEREINIGTE WIENER
METALLWERKE A. G.

Affiliated Metal Works of Vienna
Vienna, Austria

We are mailing a copy of the Iron Age Castings Manual, which contains reprints of a number of articles on foundry practice which have appeared in THE IRON AGE during recent years. Two of them refer specifically to centrifugal castings.—Ed.

INDUSTRY FACTS

Could you give us the address of the Metal Powder Association? We do not seem to have their address listed in any of our directories. Your help in this connection will be appreciated.

T. O. HOLLAND

Manager of Purchases

Ames Baldwin Wyoming Co.
Parkersburg, W. Va.

The address of the Metal Powder Association is 420 Lexington Ave., New York 17, N. Y. B. T. du Pont is president and R. L. Ziegfeld is acting secretary. The address of this and many other trade associations will be found in the Industry Facts edition of THE IRON AGE, Jan. 5, 1950.—Ed.

REQUEST FROM JAPAN

In pre-war time we subscribed to THE IRON AGE for our library use, which, of course, has been discontinued since the war. However, the library has just been re-opened recently, and we are very anxious to have your magazine among our collection.

At the same time, if there is no objection on your part, we would like to reprint in the "Journal of the Japan Society of Mechanical Engineers" published by us, the abridgement of certain articles appearing in your magazine. If you could see your

way to permit us to do so, your courtesy and kind consideration in this matter would be highly appreciated not only by us, but also by every one of the members of the Society.

F. NAKANISHI

President

The Japan Society of Mechanical Engineers
Tokyo

We are happy to hear from our friends of prewar days. We are very glad to extend permission for you to reprint abstracts from articles appearing in THE IRON AGE in the Journal of the Japan Society of Mechanical Engineers, and hope that your members will find this material interesting and helpful.—Ed.

GOLD ALLOYS

Letters to the editor have frequently appeared in your publication requesting aid on various problems. I now find myself in a position where I need some expert advice in regard to gold-copper alloys. I would like a bibliography of metallurgical information on the various gold-copper alloys and in particular the 14K alloy.

I am dealing with very fine ribbons of this material and I would like to know such things as proper annealing treatment, the effects of work hardening, the effects of low temperature soldering, creep rate of the material, elastic limit, torsional modulus and any other physical and metallurgical information that might be available concerning these alloys.

H. A. LICHNECKER

Mechanical Engineer

Consolidated Engineering Corp.
Pasadena, Calif.

There is considerable information on the gold-copper alloys, touching on the points you mention, in the 1948 edition of the Metals Handbook, published by the American Society for Metals, 7301 Euclid Ave., Cleveland, Ohio. This discussion contains a bibliography giving both U. S. and foreign references.—Ed.

THERMOCOUPLES

Recently it has been brought to our attention that an article on tungsten-molybdenum thermocouples appeared in THE IRON AGE, March 31, 1949. We would appreciate a copy of this article and any other pertinent data you may have available. We would also like to express our compliments on a very fine magazine.

WALTER LEE

Sales Engineer

Thermac Co.
Los Angeles

Copy has been sent.—Ed.

STEEL CONSUMPTION

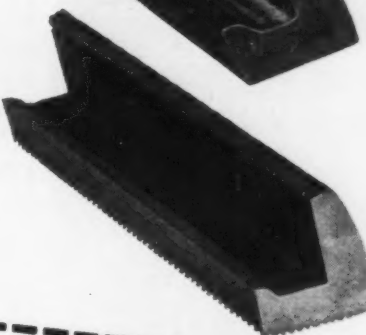
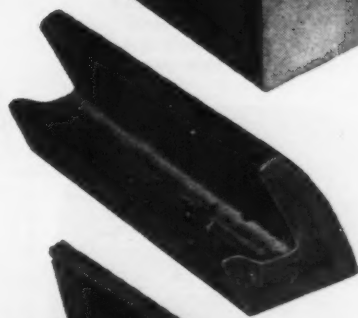
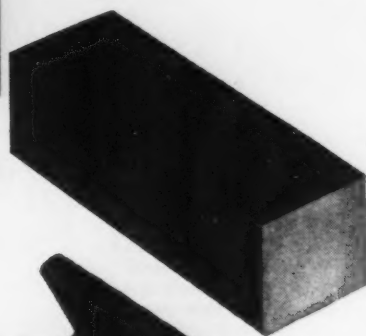
If it is possible, we would greatly appreciate receiving additional information about the steel consumed in agriculture, as shown in the table on the distribution of finished steel output in the January 1, 1948, issue of THE IRON AGE. In particular, what uses are included in the 2,422,000 tons of steel assigned to agriculture? We would be helped most by as detailed a breakdown by type of use as is available, e.g., building and repairing farm

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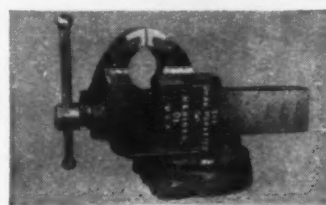
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Reg. U. S. Pat. Off.

Disston metallurgists and engineers will be glad to help you solve any of your tool steel problems.



No. 97-4 1/2 Machinist's Vise, a product of the Charles Parker Co., Meriden, Conn.

ANALYSIS OF STEEL USED

CARBON	.45/.55
MANGANESE	.60/.90
PHOSPHORUS and SULPHUR	.040 max.
SILICON	.20/.35
CHROMIUM	.80/1.10



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March 9, 1950



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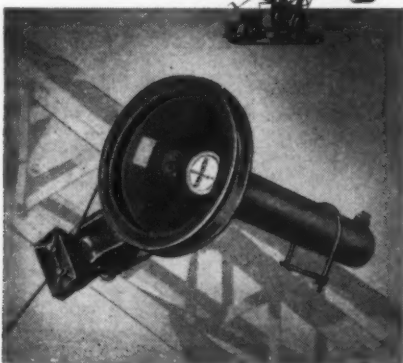
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DEAR EDITOR

Continued

service structures, baling cotton and other farm products, etc. If no breakdown is available, we should, at least, like to know whether steel used in the manufacture of tractors has been included.

W. DUANE EVANS
Chief, Div. of Interindustry Economics
U. S. Dept of Labor
Washington

The basis of the distribution study can be found in the TNEC papers, vol. 1, pp. 327-334. Tractors are not included in agriculture and haven't been for some years because there is no information to show what percentage is used on farms and what number are used by other consumer groups.—Ed.

METAL SPINNING

Can you advise me of any books or articles dealing with metal spinning, particularly stainless steel.

R. H. SQUIER
Engineering Librarian
Wright Aeronautical Corp.
Wood-Ridge, N. J.

Manufacturers' literature seems to be the best source of information on spinning of stainless. Armco Steel Corp., Middletown, Ohio, has a booklet entitled "Drawing, Forming, Spinning & Cutting of Armco Stainless Steel." A similar booklet, published by Republic Steel Corp., Cleveland, is entitled "Fabrication of Republic Endure Stainless Steels." Allegheny-Ludlum publishes what is called "Blue Sheets," which included one on spinning of stainless steel. Their address is Oliver Bldg., Pittsburgh. You also might be interested in a booklet published by Milwaukee Metal Spinning Co., Milwaukee 8, Wis., entitled "Spincraft Data Book Number Two."—Ed.

STEEL RULE DIES

We understand that your Jan. 12 issue contained an article on blanking sheet metal parts with steel rule cutting dies. Would you be so kind as to send us a copy?

M. LEE SCOTT
Accurate Steel Rule Die Mfgs.
New York

Copy has been sent.—Ed.

ROTARY TABLE

We have been trying to locate a source to supply a 16 in. rotary table that will tilt to 90°. Are there any manufacturers producing this item?

P. C. McBETH
McBeth Machinery Co.
Pittsburgh

Readers desiring to contact Mr. McBeth on this equipment should address him at McBeth Machinery Co., 1109 Grant Bldg., Pittsburgh 19.—Ed.

SOLDERABILITY

Will you please send me a tear sheet of the article entitled "Solderability of Lead-Tin Alloy Plating" which appeared in the December 8, 1949, issue?

H. GREENBERG
Metallurgical Application Section
Materials Engineering Dept.
Westinghouse Electric Corp.
East Pittsburgh, Pa.

Copy has been sent.—Ed.

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Stock carrying distributors for Ramsey
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FATIGUE CRACKS

Continued from Page 20

Apronym

To add an international flavor to the apronym roster, J. L. Francis of Foundry Services, Ltd., Birmingham, England, nominates J. H. Flux of United Steel Companies, Ltd., Rotherham, Yorkshire. The name fits the job, all right, and Mr. Flux is hereby elected chairman of the British division.

And while we're on the other side, we might mention that Mr. Francis approves wholeheartedly of the Bull of the Woods, despite the criticism of the *British Steel-maker*. "You realize," he writes, "that a high 'endurance limit' is essential to withstand 'fatigue cracks.' Maybe the editor of the objecting journal has not a sufficiently 'tough skin' or is too 'notch sensitive.'"

These metallurgists are the same all over the world.

Puzzler

W. L. Jackson of the testing lab of Public Service Electric & Gas Co., Maplewood, N. J., offers to bet a cigar that you can't *guess* the answer within 10 pct on the following:

Take a sheet of paper one mil thick and tear it in half. Combine the pieces, tear again, and continue until the paper has been torn 50 times. What is the height of the pile of paper after the 50th tear? (Please don't use your f.f.j. in checking your guess.—Ed.)

No great difficulty was experienced last week in finding which one of nine billiard balls was overweight with only two weighings on a balance. As Charles E. Norton of Highland Park, Ill., tells it: Divide the 9 balls into 3 groups of three each. Try Group 1 against Group 2 on the balance, setting Group 3 aside. If Groups 1 and 2 balance, the heavy ball is in Group 3. If not, the heavy ball is in the heavy group on the balance. Now, using only the heavy group of 3 balls, try any two on the balance, setting the third aside. The rest of the logic is pretty obvious. K. S. Frazier, research department, Detroit Steel Products Co., and H. Kelsea Moore of Eaton & Howard, Boston, also were represented in correct early returns.

Mr. Jackson and Miss Mary Jean Ralph of Victor Chemical Works have broken the scrap buyer's code; V. W. Russell of the Carborundum Co. has caught up with the dishonest bellboy; and, to further cement international friendship, D. Gluxon of Liverpool, England, has just finished counting the marbles the boy dropped on Dec. 8.

Resume Your Reading on Page 21

March 9, 1950

CUTTING-OIL RECOVERY

can pay for
an **AMERICAN
TURNINGS
CRUSHER**



Reducing long, curly turnings of steel, alloys, brass, aluminum, etc., to uniform chips—with an American Turnings Crusher—increases cutting oil reclamation to 30-50 gallons per ton!

The higher scrap value of short shovel chips . . . and the savings in storage and handling too—these are additional reasons why Americans buy themselves . . . again and again!

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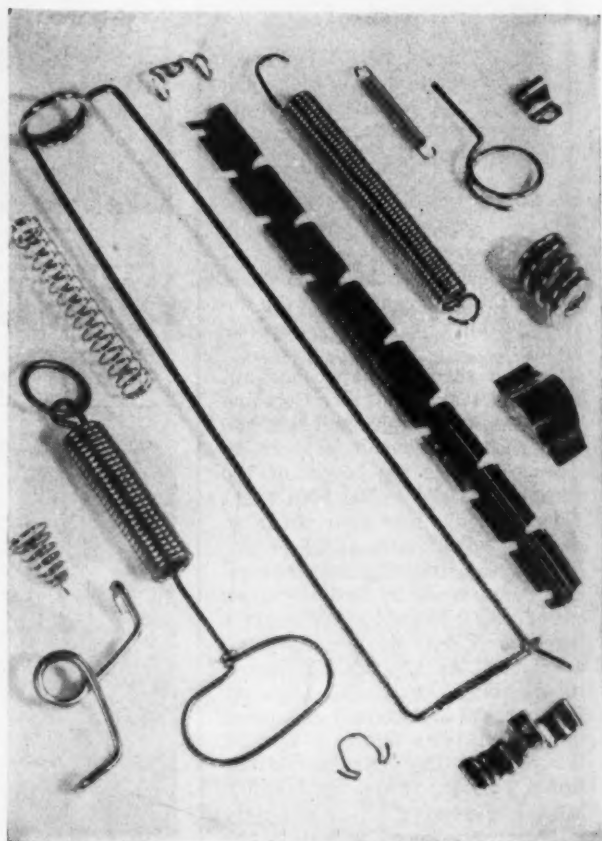
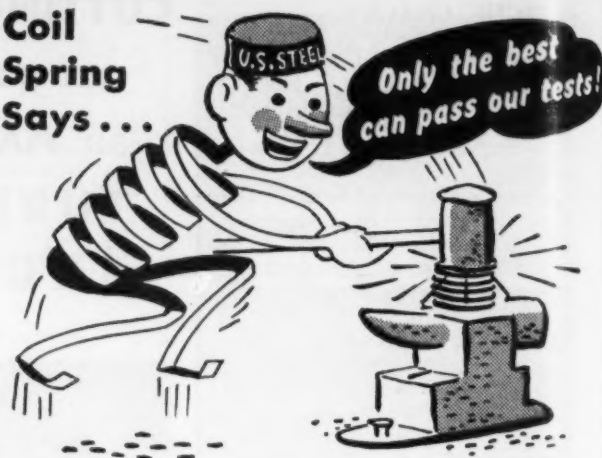


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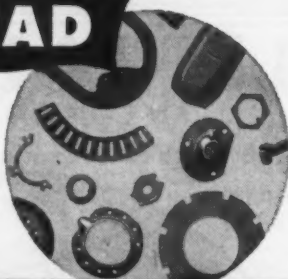
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IRON AGE INTRODUCES

Continued from Page 126

Frank F. Cambest was named assistant general superintendent of the Pittsburgh works for the JONES & LAUGHLIN STEEL CORP. Mr. Cambest was formerly superintendent of blooming and rolling mills at the Pittsburgh works. He began his service with the company in the metallurgical department in 1919.

William B. McFerrin has been appointed division executive vice president and Robert M. Briney division vice president in charge of wrought alloy products for the Haynes Stellite Division, UNION CARBIDE & CARBON CORP., Kokomo, Indiana. Both men were formerly associated with other metallurgical activities of Union Carbide.

W. T. Roberts was appointed Houston district manager of the JOHNS-MANVILLE Industrial Products Division. Henry C. Palmer was promoted to the post of Atlanta district manager, succeeding Mr. Roberts. Mr. Palmer was formerly assistant manager of the Atlanta district.

Harold J. Newton resigned as vice president and general sales manager of the NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh. The resignation was for reasons of health.

Eugene W. Beall, Jr., has been promoted from Savannah sales representative to manager of SOUTHERN STATES IRON ROOFING CO.'S branch in Columbia, S. C.

John H. Elliott was appointed assistant general manager of operations of CARNEGIE-ILLINOIS STEEL CORP. At the same time, Arno L. Billeter was named general superintendent of the company's Irvin Works, near Dravosburg, Pa., succeeding Mr. Elliott.

OBITUARIES

Robert M. Draper, 72, retired mining engineer and former superintendent of smelters in California and Nevada, died at his home in Belmont, Mass., on Feb. 18.

William J. Hanna, 64, former Chicago district sales manager of Republic Steel Corp. and vice president of Weiss Steel Co., died Feb. 21.

Frank O. Lincoln, chairman of the board of Hy-Pro Tool Co., New Bedford, Mass., died at the age of 75 on Feb. 11.

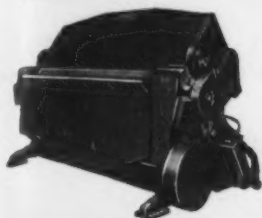
Richard Armstrong, chief metallurgist of Pittsburgh Steel Foundry Corp., Glassport, Pa., died on Feb. 17.

J. E. S. Thorpe, president of Nantahala Power & Light Co., a subsidiary of Aluminum Co. of America, died on Feb. 24.

Resume Your Reading on Page 24

CHICAGO

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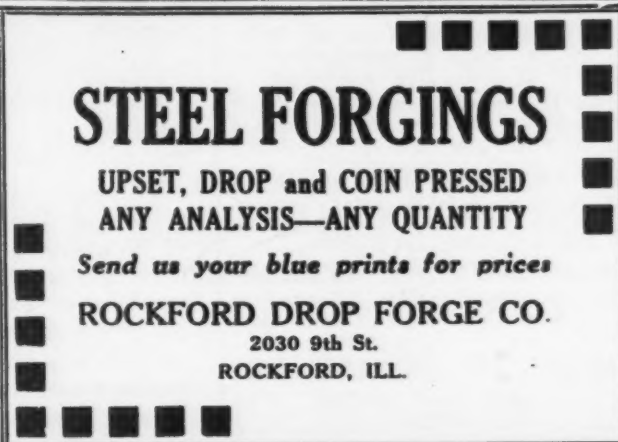
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4 3/8" Conomatic 4 spindle, serial No. 2191K with, reel, chip conveyor, extra equipment.

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4 1/2 bar Lucas No. 33. Table 46" x 64", Max. height 36", Max. to outboard support 11'.

100" Niles Bement Pond. Extra heavy type. 2 swivel heads, power rapid traverse, 35 HP direct current motor.

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15 ton 36" stroke American vertical duplex surface with tilting type workholder.

DRILL

42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

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Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

GRINDERS

6" x 18", No. 10 Brown & Sharpe "Electric Hydraulic" Three with and two without spindle oscillation. New 1940 and 1941.

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16458, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

23" x 36" Norton type C with mechanical table traverse, hydraulic quick in-feed. Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fastermatic Serial No. 2FU529, new in 1944. Quite a little tooling.

MILLERS

Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 2 1/2" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316 1/2 eccentric shaft forging. Stroke 4"; shut height 16", bed 28" F to B x 23 3/4" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11 1/2" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

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THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Philadelphia dealers report taxes hinder machine replacement

Late type machines get most play, activity in older units picking up

Some gear units move well, Millers experience fast turnover

Heavy Corporate Taxes Slow Philadelphia Machinery Sales

Philadelphia — Used machinery dealers here are appalled by the inability of the nation's industry to replace and modernize its production facilities in the postwar period. Heavy taxes, they say, are making it virtually impossible for light and heavy industry to replace obsolescent machinery. Neither new nor used equipment is being bought in the volume required to maintain efficient production facilities.

The effect of heavy taxation shows up when industry goes out to look for equipment. Even the most substantial and the largest firms are now combing the used tool market. In prewar days they bought primarily new equipment. An important factor in the greater current concentration on the used tool market is the very much higher price range of new equipment in comparison with prewar standards.

Plants Hold Good Equipment

This development means good business for the used machinery dealers. But there is a counterbalance in the difficulty of buying good used machines. Plants are hanging on to their old equipment even though there is no early prospect of using it. Management recognizes the growing difficulty of financing purchases of replacement equipment under the heavy tax burdens expected to continue for years to come. So it is taking the next best step by holding on to obsolescent machinery.

Good used equipment is hard

to come by now and dealer's cost of acquisition is generally much higher than in prewar days when replacement was more general. This, taken in consideration with the sustained demand for used machinery, has raised prices of used equipment. So buyers are choosier, insisting on modern flexibility and controls in the machines they buy. But dealers estimate that on the average, prices are about half that of new equipment.

Survey Shows Demand Still Strong for Late Type Machines

New York—A nation wide IRON AGE survey on customer buying preferences during the past 2 months has indicated that late type equipment is still getting the most play. However, sales of the older type units are on the increase because prices on these items are becoming more realistic, because of availability, and because quite a few new concerns are getting underway on limited budgets.

When drills are in stock, the dealers report that radial drills in the \$3000 to \$5000 price range experience the greatest demand. Small, old type drill presses and multiple spindle machines require more selling pressure and considerable price negotiation to make a successful sale.

Some Gear Units Move Well

With regard to gear machinery, the gear shapers and gear hobbers in the \$2000 to \$2500 price range, when available, brought immediate action. For some reason or

Turn to Page 156

THE CLEARING HOUSE

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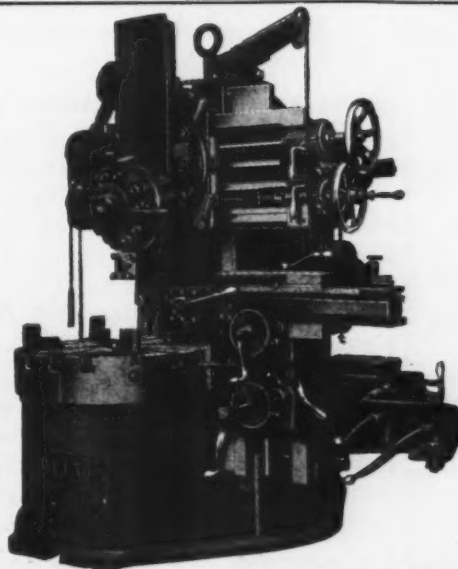
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THE CLEARING HOUSE

Continued from Page 154

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other, the entire price range of gear grinders was not moving.

Most late type horizontal boring mills and vertical turret lathes in all price ranges were active, as were vertical and horizontal broaching machines.

Centerless Grinders Are Popular

Of the grinding equipment sold during this period, the items most frequently moved were centerless grinders and rotary surface grinders in the \$1200 to \$6500 price class. Limited demand was experienced for late type crankshaft grinders. Low cost internal grinders, bench type drill grinders, and tool and cutter grinders moved slowly. Very little activity was reported for external, internal, and cylindrical types.

In the lathe category, all types of lathes from \$1200 to \$7500 have been fast movers. Tool room lathes also have a quick turnover when they can be located. Engine lathes experienced mild activity along with the high speed automatics. Automatic screw machines apparently had little demand during this period.

Milling Machines Are Active

When in stock, late type plain and universal milling machines in the \$1800 to \$5500 range caused many a quick sale. Although they were of a late type and in fine condition, most tool room duplicators, and automatic profilers did not move well. Activity in thread and spline milling machines and early hand millers was spotty. An unusual sale on the East Coast included a 54x48x16-ft planer type miller.

Spotty activity was also experienced in the miscellaneous items such as honing and lapping machines, low priced speed lathes, polishing lathes, abrasive cut-off machines, and many of the special machines such as stud threaders, nut tappers, balancing machines, swaging machines and riveters.

There was quite a bit of activity in all types of presses until the Chrysler strike situation cancelled some subcontractors' orders.

Resume Your Reading on Page 155

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GLOBAL LETTER

Continued from Page 30

Expects Increased Steel Demand

Paris—At a general meeting of the Longwy Steelworks, Mr. Raty, president, stated that although it was possible that some European steel plants had been over-equipped he did not believe this applied to French plants. In order to meet the anticipated demand of 1965 to 1970 it is necessary to put plants in operation which may at the present time have an excess of capacity. Plants very seldom operate at 100 pct capacity and at present French plants are working at 80 pct, according to Mr. Raty.

In brief, he said that although some large plants have been erected in Europe, he does not think this unwise. They are banking on an increased demand which has been steadily growing for 50 years.

Alloy Steel Production Up

Meanwhile, it is reported that French special carbon and alloy steel production has made steady progress during the last few years and in 1949 exceeded the best prewar figures. Total output increased from 782,000 tons in 1948 to 935,000 tons in 1949. However, the percentage of alloy steels produced is considerably lower than before the war while the percentage of carbon steel has increased.

More than two-thirds of the special carbon and alloy steels are used for automotive parts, machine tools, farm equipment, rolling materials and shipbuilding. Production of chromium steels has tripled since 1939. Tool steels necessary to replace stocks which have been destroyed or damaged had been in sharp demand until 1948 when the demand started to fall off. Production has been adjusted to meet current demand which is still slightly higher than before the war.

French producers of special carbon and alloy steels are modernizing their plants to meet new conditions of supply and demand. Stainless steels are expected to gain wider markets in the chemical, food processing, construction and cutlery industries.

Shipbuilding Industry Expands

The productive capacity of French shipyards is expected to reach 300,000 tons a year shortly. By January, 3 billion of the 7 billion francs allocated by the Monnet Plan for reconstruction and expansion of the shipbuilding industry had been spent. In addition, the shipbuilders themselves had spent nearly six billion francs. Prefabrication and the substitution of welding for riveting have helped to modernize French shipbuilding methods. The Shipbuilding Research Institute is studying further improvements in construction methods, fire prevention and new materials.

Resume Your Reading on Page 31

March 9, 1950

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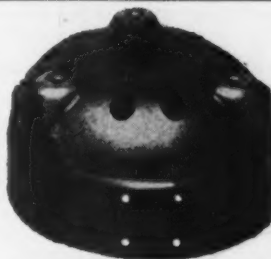
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